



# 2016 Meeting Report Turku, Finland

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June 7-9, 2016

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## I. Executive Summary

Prof. Seppo Salminen, Vice President of ISAPP, hosted the 14<sup>th</sup> annual ISAPP meeting in Turku, Finland. Main meeting participants comprised 114 professionals (44 industry scientists and 70 invited experts and board members), from 20 countries (Australia, Belgium, Canada, Denmark, Germany, Finland, France, Ireland, Israel, Italy, Japan, Mexico, the Netherlands, New Zealand, Poland, Spain, Sweden, United Kingdom, Ukraine, and the United States). The meeting featured the newest probiotic, prebiotic and microbiome science presented in various session formats, including plenary lectures, an industry-led learning forum, breakout discussion groups with group summaries, a Students and Fellows Association parallel program and rapid fire Late Breaking News talks. For the first time this year, the meeting included featured presentations by industry members targeting their sponsored research. The gala dinner was held at the Turku Castle, built in the late 13<sup>th</sup> century, and a favorite attraction for modern visitors to Turku. After the meeting, the ISAPP board of directors met to consider long range plans for ISAPP. Slides and abstracts from the meeting can be [found on the ISAPP website](#) under the “Annual Meetings” tab, but these are password protected for meeting participants only.



**Prof. Glenn Gibson introduces a plenary lecture by Prof. Colin Hill.**



**At the Turku Castle gala dinner, Prof. Seppo Salminen accepts a gift of personally labeled, naturally fermented champagne, as a thank you for his tremendous efforts as local host for the meeting. ISAPP President, Karen Scott, looks on.**

## II. Welcome from the President, Dr. Karen Scott

June 7, 2016  
Turku, Finland

Dear ISAPP participant,

Welcome to Turku and to ISAPP 2016. This year is a landmark year for probiotics, marking the 100<sup>th</sup> anniversary of the death of Elie Metchnikoff. A Nobel Prize winner, Professor Metchnikoff spent much of his life investigating the interactions between bacteria and the immune system, establishing the concept of cell-mediated immunity. Importantly, he also promoted the fact that lactic acid bacteria could improve the quality of life. He in fact drank fermented milk every day, thus founding the concept of 'probiotics', or 'bacteria for life'. His discoveries have led us to this beautiful city of Turku, so we certainly have much to be grateful for.

This year our ISAPP meeting combines our tried, trusted, and indeed essential, meeting components with some new additions. The successful Learning Forum, with topics suggested by the IAC, starts off the meeting on the first day, this year focussing on the path to development for new probiotics and prebiotics. The day is rounded off by the popular Late Breaking News session, as ever chaired by Gregor so woe betide anyone with more than the requisite number of slides! On Wednesday we have a plenary session with talks from eminent invited scientists from around the world. Together with our keynote lecture on Tuesday from our Past President, Colin Hill, I am sure we can all look forward to interesting new information in the probiotic/prebiotic and microbiome research area. New this year is a session on "ISAPP insights", which covers specific initiatives undertaken by ISAPP in the past year, as well as focus talks from some of our IAC partners.



We have expanded the number of parallel workshops to seven this year. This makes the feedback session on Thursday morning even more essential, enabling us all to get a feel for what was discussed in the other workshops we would have attended if we could split ourselves into 2 or 3 people. Despite this busy schedule, we will have time for some collegial activities, including dinner in Turku Castle on Wednesday evening, with our distinguished hosts, Duke John and his spouse, Princess Catherine of Poland.

There are an increasing number of meetings every year on "**The microbiome and...**" or "**Probiotics and the...**" or even some on "**Prebiotics and...**". But the ISAPP meeting continues to be a sought-after event in the field. Members of the board are constantly asked about the meeting, and 'how do you get to go to it?' from industry and academic scientists from all over the world. ISAPP is unique in that attendance is limited to two participants per industry partner, and attendance by non-industry scientists is by invitation only. It is rare that these coveted invitations are refused, resulting in outstanding quality of plenary speakers and workshop participants. Participation by the Student and Fellows Association is essential to engage the next generation of scientific leaders. Indeed this year the SFA have two separate half-day programmes.



We are at both an exciting and a challenging time in the science of probiotics, prebiotics, and the multitude of other “...biotics” terms which are increasingly encountered. Thus it is ever-more important that the benefits of all these new products are backed by sound scientific evidence of health benefits, rather than being driven by commercial production pressure. This is of course the “raison d’etre” of ISAPP. ISAPP’s scientific independence has a key role in keeping the debate focussed on the best science. Ultimately, this will influence regulators, and reward the industries who do the very best research and offer reliable advice to practitioners and consumers alike.

We appreciate the support of everyone at this meeting, the scientists who give their time and efforts freely and the industry whose support makes it all possible. I want to especially acknowledge the ISAPP Board (see below), all leaders in their fields who give considerable time and effort to keep ISAPP on track. We are saddened this year that our board will lose Todd Klaenhammer as a member. He was with ISAPP at its founding and has been an insightful leader of the organization for 14 years. Each year, a new Industry Advisory Committee representative is elected. We want to thank Saskia van Hemert for her service and welcome Margriet Schoterman for this coming year. ISAPP greatly depends on the dedication of our Executive Science Officer, Mary Ellen Sanders, and we appreciate her continual efforts in keeping ISAPP moving forward. A special extra thanks to our vice-president and meeting organiser, Seppo Salminen, who has meticulously organised this meeting, and chosen our venue and social events with extreme care and thought for maximum enjoyment.

Once again, welcome to Turku, in the ‘land of the midnight sun’ and enjoy the meeting,

Regards

A handwritten signature in black ink that reads "Karen P. Scott". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Karen Scott,  
President ISAPP

### III. Discussion groups (Summaries submitted by group chairs)

#### Group 1. Colic Update: IPDMA and Mechanisms. Chairs: Michael Cabana and Dan Tancredi



There have been several randomized controlled trials around the world investigating the role of probiotics in colic, a common condition that affects up to 1 in 5 infants. The results of these studies have varied. In 2014, an ISAPP work group initiated an individual patient data meta-analysis (IPDMA) to pool data from relevant studies together to provide a more definitive assessment of the effectiveness of the probiotic *L. reuteri* DMS 17938 for the treatment of colic. A peer-reviewed manuscript describing the IPDMA protocol was published in *BMJ Open* in 2014

(<http://bmjopen.bmj.com/content/4/12/e006475.abstract>) and the individual-level data from relevant trials have been assembled, verified for accuracy, and then subject to planned statistical analysis for the IPDMA. The purpose of the meeting this year was to convene the IPDMA investigators to review study progress and to discuss and resolve specific technical challenges that were discovered during data assembly and analysis. The technical challenges concerned between-study differences in how some study variables were defined and measured. Drs. D'Amico and Tancredi reported the results of the successfully undertaken data assembly and verification tasks, reported preliminary findings from the statistical analysis, and described the technical challenges needing resolution. The group was successful in developing and agreeing to resolutions of all of these challenges. We also developed an updated timeline and work plan for completing the final analysis and for publishing results in the upcoming year. Finally, we determined the eligibility and order of manuscript authors. We anticipate a high impact publication describing strong evidence for the effectiveness of this probiotic in treating infant colic in breastfed infants and insufficient evidence for effectiveness in formula-fed infants. We also acknowledge the crucial role of ISAPP in facilitating this international collaboration, which has established a successful example and framework for future IPDMA of probiotic trials.

**Group 1 Participants:** Michael Cabana, Kim Chau, Frank D'Amico, Flavia Indrio, Anna Partty, Francesco Savino, Valerie Sung, Hania Szajewska and Daniel Tancredi

**Group 2. Evidence- based expectations for probiotics. Chairs: Daniel Merenstein and Irene Lenoir-Wijnkoop**



The objective of this group was to review the evidence of probiotic usage for common health concerns and -if sufficient- give suggestions how to implement their usage. For this purpose, two well-studied conditions, irritable bowel syndrome (IBS) and common respiratory tract infections (RTIs), were selected. Both have traditional treatments that often provide limited value at high adverse rates. IBS occurs in a very heterogeneous population and is associated with many comorbidities. In the absence of efficient treatment modalities, probiotics offer an interesting alternative in the daily management of IBS, although the degree of response will vary from subject to subject.

In common RTIs, many traditional measures have shown no or limited effectiveness. The results of probiotics in this indication are encouraging. To identify effective interventions and understand expected benefits in preventing or decreasing the severity of respiratory infections, treatment trials should compare probiotics and standard treatments, using common outcomes; studying relatives of acute subjects in a family setting would allow to measure if there is improvement in incidence, duration and/or severity.

Pooling the available data is a reasonable way to analyze the different strengths of evidence. Specific strain effects need further study.

The group concluded that probiotics have a great potential, but still do not form part of standard care, partly because of a lack of good information to physicians and confusion due to many different products and strains. The following action items were identified:

- provide evidence summaries and approach the appropriate bodies, such as the United States Preventive Service Task Force to consider probiotics as a new topic for establishing guidelines. When moving forward in this direction, we strongly believe that quality requirements and third party verification become essential.
- elaborate clear and concise recommendations considering also a “practice option” based on a different kind of quality, in particular as long as there is no particular harm and risk management is not a concern. develop educational initiatives for students (together with ISAPP-SFA) and translating the available evidence to make it more accessible to clinicians, pharmacists and end-users. The ISAPP website could feature a ‘How to read a probiotic paper’.
- evaluate the interest of reviewing the influence of probiotic intake on the use of antibiotics.

The above mentioned items would further contribute in a building a comprehensive and convincing evidence-base on probiotics. As an organization, ISAPP can join forces with various partners, bring science and stakeholders (including patient oriented research center, advocacy groups, etc...) together and thus help enhance probiotic understanding and utilization.

**Group 2 Participants:**

Valerie Benoit, Mark Ebell, Margaret Haldeman, Sarah King, Marie Emmanuelle Le Guern, Irene Lenoir-Wijnkoop, Greg Leyer, Jeffrey Linder, Dan Merenstein, Michael Moore, Louis Ndife, Gunilla Önning, Alejandro Palacios, Bruno Pot, Mary Ellen Sanders, Christophe Sauce, Lawrence Schiller, Andi Shane, Hideyuki Shibata, Yvan Vandenplas, Peter Whorwell and Jessica Younes.

**Group 3. Next generation probiotics. Chairs: Colin Hill, Paul O’Toole and Julian Marchesi**



This session discussed the potential for, and likely nature of, next generation probiotics. Next generation probiotics could include non-‘traditional’ genera/species from the microbiome, genera/species from other sources, Archaea, genetically modified microorganisms (including genetic

knockouts, microbes with regulatory changes, knock-ins containing genes of microbial and non-microbial origin, metabolic cripples for biological containment) and perhaps even completely synthetic microbes. Examples were presented from the speakers on most of these topics, including exciting new evidence on the probiotic capabilities of newly characterized species such as *Akkermansia muciniphila*, *Intestinimonas butyriproducens* and *Eubacterium hallii* (de Vos) and the potential for genetically modified microbes producing therapeutic proteins of human origin (Steidler). Evidence was presented of ongoing investments by at least one large commercial provider of bacterial cultures to build facilities that allow the production of strict anaerobes to industrial (GMP) levels. Another presentation (O'Toole) summarised the current activity among spin-out companies to exploit opportunities with next generation probiotics.

There was a general consensus that next generation probiotics will be largely developed by the pharmaceutical sector, and under current regulatory conditions are very unlikely to be delivered in food matrices. This is both a reflection of the high costs of the clinical trials required to demonstrate efficacy and the current restrictions on using food to diagnose, treat, prevent or cure disease.

Participants discussed the possibility that for diseases with complex aetiologies (diet x genetics x epigenetics x lifestyle x microbiome) we may be entering a new paradigm in medicine, moving away from big pharma (small molecules) and towards biologicals (including probiotics or Live Biotherapeutic Products) with low toxicity but variable outcomes in individuals. The future may involve treatment paradigms whereby individuals with certain diseases (especially chronic conditions) seek low cost, low toxicity individual solutions, building lifestyle appropriate solutions.

It was recognised that while it represents a significant challenge for industry to anticipate and commercialise next generation probiotics, there is a need for scientific excellence and investment to drive this exciting new phase of probiotic science.

**Group 3 Participants:** Colin Hill, Paul O'Toole, Julian Marchesi, Willem de Vos, Reetta Satokari, Johan van Hylckama Vlieg, Lothar Steidler, Andy Benson, Phillippe Langella, Andrew Jermy, Arthur Ouwehand, Karen Scott, Stephan Roos, Deshanie Rai, Michael Janusz, Danielle de Montigny, JoMay Chow, Sylvie Binda and Carroll Reider.

**Group 4. Regulatory developments for Probiotics and Prebiotics in European Union: do they change the road to the market? Chairs: Seppo Salminen and Magnus Friberg**







In the European Union, the introduction of novel microbes for food and potential probiotic use has increased rapidly. At the same time, also novel prebiotic components have been approved for food and infant and these include human milk oligosaccharides as prebiotics. All regulatory issues pertaining to novel probiotics and prebiotics and health claims for probiotics and prebiotics have increased in importance. Tools to manipulate the gut microbiota for improving health outcomes are in demand as the importance of the gut microbiota on almost all aspect of health have been revealed. Some probiotics and prebiotics have been used for decades, but probiotics and prebiotics targeted toward unique outcomes and functionalities are a more recent phenomenon and many more can be expected to emerge.

The discussion focused on the legal approval of health claims for consumer marketing, the indirect marketing to health professionals (which has been discussed by EU regulatory authorities) and the fact that the recommendation of specialized medical societies such as ESPGHAN (The European Society for Paediatric Gastroenterology Hepatology and Nutrition) might offer a more efficient route to market, especially for pediatric use. ESPGHAN gives evidence-based recommendations for children, and they recommend providing specific probiotics for prevention and treatment of acute gastroenteritis, antibiotic side effects, and reducing the risk of allergic disease. During the discussion, it was commented that without legal approval for a health claim, marketers cannot recommend the use of probiotics if the aim is that unapproved health claims reach consumers. However, it seems that recommendations are allowed when they don't have a commercial purpose.

Today, the role of bloggers giving personal opinions and the companies sending products to the bloggers is also one way of communicating health benefits. This has, however, also attracted the attention of the regulators and using bloggers to deliver an unapproved health claims might be considered illegal.

Health care professionals are a viable route to market as they are allowed to give probiotic recommendations. These professionals would like to give recommendations to help their patients. Recommendations by health professionals also tend to have a strong impact for patients. Guidelines are needed for offering scientific evidence for clinicians to consider.

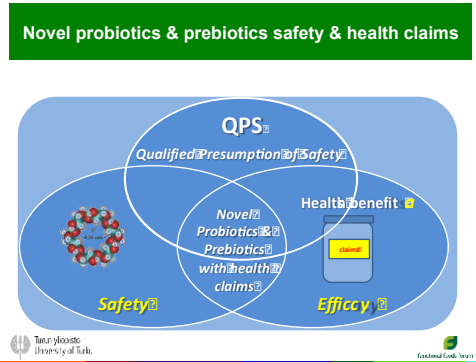


Figure 1. Stages of novel food and health claim assessment in the European Union.

Other points mentioned in the discussion included the following: 1) The use of probiotics as food supplements without a claim, 2) The suggestion that there are no claims on probiotics because of legal restrictions, and 2) The general relation between researchers and lawmakers in the EU.

The lawyer group was on the opinion that if claims on probiotic functionality are clearly demonstrated, there are no restrictions regarding the approval of a claim. The new guidance document could help on that. “Health” is defined as absence of disease. It was generally agreed that there is a great need for achieving a health claim for probiotics, perhaps starting with something simple and easy such as intestinal motility, digestive comfort, or constipation. However, there is a real challenge in finding microbiota related unanimously acceptable biomarkers. It may be useful to avoid immune system claims as they are related to complex diseases without a complete picture on mechanisms.

*Novel food: revised regulation of 2016.* The regulations governing introduction of novel probiotics and prebiotics vary by geographical region. In some cases, confusion can result in differentiating novel foods from functional foods. The fundamental difference between these two categories of foods is that novel foods must be evaluated based on their safety, whereas functional foods need to be evaluated for any desired health claims. Figure 1 demonstrates that the terms are distinct but sometimes foods and food ingredients fall in both categories, which then necessitates evaluation for both safety and efficacy. The new guidance by EFSA (2015) on novel food dossier requirements significantly helps in collecting and processing the data for novel food application. A model of a safety assessment of a potential probiotic has been given by Comez-Gallego and coworkers (2016) for the proposed probiotic *Akkermancia muciniphila*. It is clear though, that the current guidance for novel foods is vague on assessing the safety of novel microbes and therefore, the task often is given to the Biohazard Panel QPS working group. Safety assessment criteria have been discussed in the Commission Regulation of *Clostridium butyricum* as well as the EFSA assessment of *Bacteroides xylanisovens* (EFSA 2015). On other aspects, there is no clear agreement what constitutes a significant evidence of use for microbes and how to handle a bacterium which is present in the gastrointestinal tract in larger amounts but is not usually consumed within foods (Comez-Gallego et al 2016).

*Health Claims: Impact of new guidance document.* No health claims have been approved for probiotics since the last working group evaluation (Kumar et al 2015). However, there are some accepted health claims for prebiotics such as the claim for bowel function for the prebiotic chicory inulin (EFSA 2016).

This clearly demonstrates that such claims are potentially possible also for probiotic bacteria. The new EFSA guidance (EFSA 2016b) also assists in the development of claim dossiers by combining gut health related cases (both positive and negative) for the applicants benefit. The guidance also suggests potential markers of disease which could be used (EFSA 2016). What is new in the new guidelines is that

1. there are public consultations at the beginning and at the end of health claim approval,
2. clear examples of negatively and positively evaluated health claims are included in the guideline

Another development in health claims is the discussion by European Union member states, six of which have proposed the approval of the terms *probiotic and prebiotic* as means of providing a nutrition claim when a common microbiota balancing effect has been demonstrated. (Banares 2016.) If the term could be used in marketing as other nutrition claims, it would facilitate progress in the area and no health claims would necessarily be needed. The question was also presented that the term “probiotic” or “prebiotic” could be used as a article 10.3 claim and accompanied by the approved health claim for yoghurt. With health claims, it is important of focus on which is the target group (whole population vs. smaller groups).

It was discussed if the claim legislation should be revised. It should be studied whether it a good legislation, and what areas need to be improved. We have no clear answers, but the regulation requires assessment of the impact of the regulation by 2013. Thus, ISAPP should perhaps spread the idea of regulatory impact assessment, including consumer impacts, and impacts on industries, science, and innovation within the EU.

*Nutrition Economic Cost-Benefit Assessment.* Nutrition economics is a relatively new area of research focusing on the impact of special nutrition or special nutritional products on the economic benefits of nutrition counselling (Lenoir –Wijnkoop et al 2011 & 2012a). The cost-effectiveness of the use of prebiotics was assessed for the primary prevention of atopic dermatitis in The Netherlands. A model was developed to estimate the health economic impact of prebiotic preventive disease management (a prebiotic mixture of galacto- and long chain fructo-oligosaccharides) of atopic dermatitis in infants (Lenoir –Wijnkoop et al 2012b). This study shows that the favourable health benefit of the use of a specific mixture of prebiotics results in positive short- and long-term health economic benefits. In addition, this study demonstrates that the use of infant formula with a specific mixture of prebiotics is a highly cost-effective way of preventing atopic dermatitis in The Netherlands. In another study, Lenoir-Wijnkoop and coworkers (2014) demonstrated that the use of a fermented dairy drink with the probiotic *L. paracasei* CNCM I-1518 in elderly hospitalized patients to prevent AAD could lead to substantial cost savings.

Taken together, the economic assessment should be a major consideration when the evaluation of probiotic and prebiotic health benefits is performed. Economic impact assessment is already used in relation to environmental regulation and medicine law, and could also form a part of food law and its application. This is perhaps a matter that ISAPP could promote in the future.

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- van Loveren H, Sanz Y, Salminen S. Health claims in Europe: probiotics and prebiotics as case examples. *Annu Rev Food Sci Technol.* 2012;3:247-61.

**Group 4 Participants:** Silvia Banares, Anu Lähteenmäki-Uutela, Ambroise Martin, Maria Carmen Collado, Carlos Gomez, Tuula Tuure, Margriet Schoterman, Stephan Theis, Mikkel Jungersen, Frank Grattepanche, Seppo Salminen and Magnus Friberg

**Group 5. Prebiotics, probiotics and common GI symptoms in the general population (not diseases).**

**Chairs: Eamonn Quigley and Sarah Lebeer**



The focus of this workshop was on the potential role of interventions that impact on the microbiome and of probiotics and prebiotics, in particular, on common GI symptoms in the community but those which are not due to well-defined syndromes, such as irritable bowel syndrome (IBS) or inflammatory bowel disease (IBD). Community- and primary care-derived data make it abundantly clear that

symptoms, such as heartburn, indigestion, bloating and minor constipation are, not only highly prevalent in the general population, but frequently co-exist. These symptoms are similarly common in children where antibiotic use has emerged as a major risk factor for a variety of GI and systemic ills; here there is real potential for probiotic and prebiotics to play a preventive role. Currently, these symptoms are either self-managed by dietary or over-the-counter remedies or, less commonly, addressed by the family doctor. The focus for the latter is symptomatic management. Data from a survey from Mexico suggested that probiotics are already a popular recommendation by physicians but, while there have been several studies in defined syndromes, such as IBS, there is, at present, paltry data on the impact of both prebiotics and probiotics on non-syndromic GI symptoms. There are challenges to such studies: defining optimal outcome measures, the impact of a floor effect on population size and choosing optimal strains and formulations. Nevertheless, the workshop concluded that these common GI symptoms are a valid target for therapy with prebiotics and probiotics and that this approach would be welcomed by sufferers and health care professionals alike.

#### **Group 5 Participants:**

Ana Teresa Abreu, Lars Agr us, Kirstie Canene-Adams, Francisco Guarner, Pali Hungin, Ali Keshavarzian, Niklas Larsson, Sarah Lebeer, Toshihisa Ota, Gonca Pasin, Eamonn Quigley, Yehuda Ringel, Tamar Ringel-Kulka and Elaine Vaughan.

#### **Group 6. How do probiotics and prebiotics work at distant sites? Chairs: Samuli Rautava and Gregor Reid**



1. Skin – the nature of the skin makes it feasible to apply probiotic and prebiotic interventions locally and through systemic routes. The gut brain barrier is critical to skin health.
2. Programming at birth – rapid shifts rather than chronic disease can influence long term outcomes. Breast feeding and more intake of fermented foods may improve diversity and optimize organ development.
3. Airways – most problems arise in young and elderly. For allergy and asthma, early intervention is best; while lozenges and oral products might influence oropharynx in adults. The transient nature of the lung microbiome could potentially offer a means for probiotic and prebiotic application.

4. Cardiovascular – Probiotics may remodel an injured heart through increasing adiponectin-leptin ratio, and pre- and probiotics can reduce cholesterol and have a place as a substitute for some of the extreme statin prescribing.
5. Brain – New evidence of bacteria in the brain (HIV and Alzheimer’s) defies the brain-barrier sterility notion. Some diseases may be targeted Some conditions may be ‘programmed’ in early life:Autism, Anxiety, Depression, Attention deficit disorder, and others with later triggers: Parkinson’s, Alzheimer’s, Post traumatic stress disorder, Dementia, Schizophrenia. Different regions of the brain are affected and may require targeted organisms via the gut-vagus link or through the bloodstream. Targetin neuron regeneration would be exciting.
6. Pre-diabetic – We need to consider foods eaten by our ancestors, such as the forgotten vegetables (Jerusalem Artichoke, Parsnips, Romanesco etc) and resistant starch to delay onset of metabolic syndrome. We Need to examine cohorts in extreme conditions such as International Space Station, Antarctic, Hadza hunter gatherers, vegans and others to better understand the food-gut-metabolic linkages.

**Group 6 Participants:** Thomas Abrahamsson, Michael Bailey, Laure Bindels, Rostyslav Bubnov, Rachel Buck, Emilie Fargier, Kriston Ganguli, Kristina Magnusson Borg, Sarmauli Manurung, Christopher Martoni, Alexandra Meynier, Seema Mody, Catherine O’Neill, Samuli Rautava, Gregor Reid, Helene Savignac, Noam Ship, Michael Surette, Kieran Tuohy and Saskia van Hemert.

**Group 7. The culture of fermented foods, including prebiotic and probiotic aspects. Chairs: Bob Hutkins and Maria Marco**



The main goal of the ISAPP Group 7 was to evaluate current knowledge on the health benefits of fermented foods and, specifically, to consider the prebiotic and probiotic activity of those foods. The discussion was guided by several leading questions: Are fermented foods healthy foods? If so, is this due to living microbes in “fresh” fermented foods? Should fermented foods be considered as sources of



prebiotics and/or probiotics? Is it possible to conduct controlled, human studies on the health benefits of fermented foods?

Our discussion led to several main conclusions:

(1) The fermented foods category is highly complex and encompasses foods and beverages with diverse starting materials (e.g. milk, meat, fish, grains, fruits and vegetables) and processing steps (such as thermal treatment or filtration). Additionally, there is the considerable variation among the microorganisms responsible for the different fermented food types (e.g. bacteria, yeast, and molds). For particular fermented food types, there is variation in the species and strains present both between facilities and processing dates. Therefore, the group concluded that it is important to avoid sweeping generalizations about all fermented foods and instead focus on single or limited numbers of well-defined, fermented food types when discussing health benefits.

(2) Foods and beverages can have enhanced or added nutritional, prebiotic, and bioactive attributes as a result of fermentation. Depending on the raw materials and the microbes responsible for the fermentation, the fermentation process can inhibit pathogens, improve digestibility, remove toxins or problematic compounds (e.g. lactose), increase vitamin content, and produce functional byproducts such as peptides and prebiotics. These properties are either general to the food type (e.g. high acid content) or could be limited to specific strains (e.g. B vitamin biosynthesis).

(3) Some fermented foods are a source of living, potentially probiotic bacteria. Those foods contribute a significant number of living microbes to the human diet. Yogurts are the best understood fermented food for providing probiotic cultures. Yogurts are of particular note because they contain the bacteria needed for yogurt fermentation, but also are the most common food source of added, established probiotic strains (indeed, yogurt is one of the few foods that EFSA has approved for a health claim). The probiotic qualities of diverse lactic acid bacteria isolated from fermented foods have been shown in preclinical studies to reduce inflammation, obesity, and cardiovascular disease risk. However, few clinical randomized controlled trials investigating the probiotic benefits of fermented foods have been performed. .

In summary, our discussion group agreed on the broad benefits of fermented foods beyond the raw starting materials. More challenging is the goal of differentiating whether the health benefits of fermented foods are specifically due to the chemical transformations of the food or the living microbial contents (when present) or a combination of both. Because most fermented foods have an undefined, mixed microbial content, carefully controlled studies require a food with a well-defined and quantified microbial composition. Elucidating the “core” or “general” benefits of food fermentations would provide a unique direction establishing prebiotic and probiotic claims on those foods.

**Group 7 Participants:**

Chris Cifelli, Paul Cotter, Benoit Foligne, Michael Gänzle, Glenn Gibson, Burce Hamaker, Dustin Heeny, Bob Hutkins, Remco Kort, Maria Marco, Anne Pihlanto and Eddy J. Smid.

## IV. Learning Forum

The Learning Forum is a program that addresses topics chosen by ISAPP industry members to cover topics they would like to see addressed either in more depth than is typically possible in a plenary lecture or with a range of experts, who can discuss different aspects of a complex topic. The 2016 Learning Forum focused on the development path for probiotic or prebiotic food products. It featured talks on conducting human trials, from the perspectives of a clinician (Eamonn Quigley, MD) and a statistician (Daniel Tancredi PhD). Then a perspective from European Union regulatory was offered by Prof. Seppo Salminen (Functional Food Forum, University of Turku), Leena Mannonen (Ministry of Agriculture and Forestry, Finland) and former Chair of the EFSA NDA panel, Dr. Ambroise Martin.

## V. Late Breaking News

This session is an opportunity for people to give short presentations (5 min) on late breaking news topics in an informal, interactive atmosphere. These presentations range from 'hot' off-the-bench news from lab/clinic to controversial or important issues on the science, politics, funding, business or humorous aspects of the field of probiotics or prebiotics. Session format: Maximum of 5 min, three slides, no kilts. Grab a beer or glass of wine and ask provocative questions at this informal session. Poster session and reception will be ongoing before, during and after this session in the Crystal Hall.

### Schedule for 2016 Late Breaking News session

Evaluation of extracellular polysaccharide (EPS) - containing Bifidobacterium strains for anti-inflammatory activity	Michael J. Janusz, P&G
Antibiotics produced by probiotics - is reutericyclin from Lactobacillus reuteri a probiotic trait?	Michael Gänzle, University of Alberta
Biofilms: The underestimated role of the microbial forest	Jessica Younes, Winclove, Netherlands
Prebiotic modulation of inflammatory processes by directly regulating host kinome	Richard Y. Wu, University of Toronto
In vitro fermentation of B-GOS: Impact on gut bacterial populations and metabolic activity in autistic and typically developing children	Roberta Grimaldi, Reading, UK
Using prebiotics to maintain a Lactobacillus-dominated vaginal microbiome	Stephanie Collins, London, Canada
Lactobacillus love for sweets prevents pathogenic biofilms	Mariya Petrova, Belgium
Microbiome, food and pain	Rostyslav Bubnov, Ukraine
New FDA Final Rule (regulation) on fiber labeling impacts prebiotics	Bruce R. Hamaker, Purdue University, USA
2016 update of WGO clinical guidelines for probiotics and prebiotics for adult and pediatric populations	Hania Szajewska, Medical University of Warsaw
Probiotics - thank God for life	Gregor Reid, London, Canada

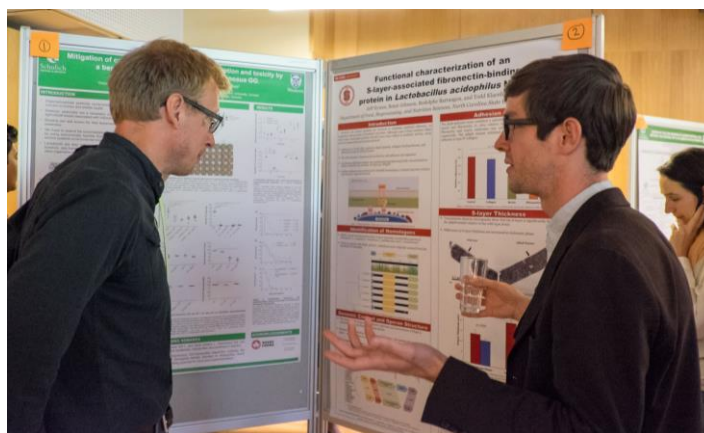


## VI. Students and Fellows Association Program



**The Student and Fellows Association Participants in the 2016 ISAPP/SFA meeting**

The SFA's goal is to create an interactive network of graduate students and postdoctoral fellows across the globe working on probiotics, prebiotics or related fields. They succeeded in this mission in Turku this year by assembling a group of 32 students from the following countries: Canada, Luxembourg, Finland, UK, Belgium, Spain, USA, Ireland, New Zealand and Colombia. Students and fellows each shared the core focus of their research in rapid, 3 minute talks. They convened a workshop on analyzing 16S and transcriptome sequencing data. The students and fellows presented 31 posters in the main ISAPP meeting. Four SFA members presented their research in the Late Breaking News session. This year, networking and opportunities for knowledge exchange with the main meeting participants was enhanced; the students were integrated into the main program for all activities except the discussion groups. The poster session titles and full SFA program follow. Poster abstracts and conference summary available at <http://www.isapp-sfa.com/turku>.



**Jeff Hymes (R), SFA Communications and Web officer, discusses his research poster with Stephan Roos from BioGaia.**



## 2016 ISAPP Student and Fellow Association Poster Session

Name	Poster title	Affiliation
Jean Macklaim		University of Western Ontario, Canada
Mark Trinder	<i>Lactobacillus rhamnosus</i> GR-1-mediated reduction of organophosphate pesticide exposure	University of Western Ontario, Canada
Jeff Hymes	Functional analysis of an S-layer associated fibronectin-binding protein in <i>Lactobacillus acidophilus</i> NCFM	North Carolina State University, USA
Mariya Petrova	Lectin-like molecules of <i>Lactobacillus rhamnosus</i> GG inhibit pathogenic biofilm formation	KU Leuven, Belgium
Juhani Aakko	Still waiting for his abstract	University of Turku, Finland
Stephanie Collins	Lactulose, a gut prebiotic, has potential to modulate vaginal microbiota	University of Western Ontario, Canada
Kacy Greenhalgh	A study of the molecular mechanisms underlying the response of human colorectal adenocarcinoma enterocytes to prebiotics and probiotics	University of Luxembourg at the Luxembourg Centre for Systems Biomedicine, Luxembourg
Carlos Gómez Gallego	Encapsulated polyamines: a proposed new ingredient for infant formulas	University of Turku, Finland
Suzanne Harris	Cell Wall Polysaccharides and Prebiotic Activity	Rothamsted Research, UK
Irina Spacova	Prophylactic administration of wild type and recombinant <i>Lactobacillus rhamnosus</i> GG (LGG) in a mouse model of Bet v 1 allergic sensitization	KU Leuven, Belgium
Nuria Castro-Bravo	Fluorescence labeling in <i>Bifidobacterium animalis</i> subsp. lactis, a way to decipher the role of exopolysaccharides in host-bacteria interaction	Dairy Research Institute, (IPLA-CSIC), Spain
Dustin Heeney	<i>Lactobacillus plantarum</i> improves metabolic outcomes and informs colonic immune state in mice fed a high fat diet	University of California, Davis, USA
Conall Strain	The effects of <i>Laminaria digitata</i> fibres on the gut microbiota: An <i>in vitro</i> and <i>in vivo</i> investigation.	Teagasc/Ulster University, Ireland

Min Min	Viability of probiotics in non-dairy foods during storage	Lincoln University, New Zealand
Lis London	Anti-atherogenic effect of probiotic <i>Lactobacillus mucosae</i> DPC 6426	Teagasc, Ireland
Rebecca Duar	Ecological relevance of the pdu-operon in <i>L. reuteri</i> human isolates	University of Alberta, Canada
Marianne van den Broek	Antimicrobial effect of potentially probiotic lactobacilli against otitis media pathogens <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> and <i>Moraxella catarrhalis</i>	University of Antwerp, Belgium
Himanshu Kumar	Association of secretor status with microbial changes observed during pregnancy	University of Turku, Finland
Camille Allonsius	Antipathogenic and immunomodulatory activity of <i>Lactobacillus exopolysaccharides</i>	University of Antwerp, Belgium
Emille Catry	Correction of endothelial dysfunction and modulation of gut microbiota following a prebiotics supplementation in atherosclerosis prone mice	Université catholique de Louvain, Belgium
Stephania Aragón Rojas	Design of culture medium as carrier material for improve the survival of colombia native probiotic	Universidad de La Sabana, Colombia
Samantha Stone	A randomised, placebo-controlled parallel study to determine the effects of supplemented oral rinses on the oral microbiota	University of Reading, UK
Richard Wu	Human milk oligosaccharides protect gut epithelial barrier function in mouse model of necrotizing enterocolitis.	University of Toronto, Canada
Elke Lievens	Unraveling the contribution of vaginal <i>Lactobacillus</i> species to the vaginal barrier function and their potential against HSV-2 infection	KU Leuven, Belgium
Claire Merrifield	Early post-natal environment and supplementation of <i>B. lactis</i> NCC2818 exert a sustained influence on the developing immune system and on gut microbial co-metabolism in the pig	Imperial College London, UK
Izaskun García-Mantrana	Potential effect of perinatal factors on the human milk microbiome variability	Institute of Agrochemistry and Food Technology, Spain
Sineaid Collins	Investigating mixtures of novel prebiotics and their impact on appetite regulation	University of Reading, UK
Ilke De Boeck	Comparing the nasopharyngeal microbiome of healthy individuals and chronic rhinosinusitis patients.	University of Antwerp, Belgium
Alba Boix-Amoros	Relationship between milk microbiota, bacterial load, macronutrients and human cells during lactation	Universidad Politecnica de Valencia, Spain

Roberts Grimaldi	<i>In vitro</i> fermentation of B-GOS: Impact on gut bacterial populations and metabolic activity in autistic and healthy children	University of Reading, UK
Akhilesh Dhanani	Comparative genomics of <i>Lactobacillus</i> strains originated from gastrointestinal tract and vagina	Dalhousie University, Canada
Natasa Mantziari	Natasha is from Turku and she will join us, but without presenting a poster	University of Turku, Finland



# Turku 2016

June 7-9, 2016  
Radisson Blu Marina Palace Hotel

## Tuesday, June 7

<b>Morning</b> <i>Crystal Hall</i>	<b>POSTER SETUP</b> SFA members set up posters during the day for evening poster presentations
<b>09:00-10:30</b> <i>Dining Room</i>	<b>3-MINUTE THESIS STYLE INTRODUCTION</b> SFA members present their work
<b>10:30-11:00</b>	<b>BREAK</b> Snacks and beverages provided
<b>11:00-12:30</b> <i>Dining Room</i>	<b>3-MINUTE THESIS STYLE INTRODUCTION, CONT.</b> SFA members present their work
<b>12:30-14:00</b>	<b>LUNCH</b> SFA will join ISAPP members for lunch
<b>14:15-14:45</b> <i>Kustaa-Juhana virome,</i>	<b>KEYNOTE LECTURE</b> <i>How to account for the whole microbiome (including phageome, archaea, helminths, etc.) when assessing pro/prebiotic effects on the microbiome?</i> <b>Colin Hill, University College Cork</b>
<b>15:00</b>	<b>REFRESHMENTS</b>
<b>15:00-17:00</b> <i>Crystal Hall</i>	<b>POSTER SESSION AND WELCOME RECEPTION</b> SFA members will present posters for judging
<b>17:15-17:45</b> <i>Kustaa-Juhana</i>	<b>Lecture</b> <i>What evidence does it take to substantiate non-drug claims? Lessons from Bayer v. FTC</i> <b>Dan Merenstein, Georgetown University Medical Center</b>
<b>18:00-19:00</b> <i>Kustaa-Juhana</i>	<b>LATE-BREAKING NEWS</b> Chair: Gregor Reid, University of Western Ontario
<b>19:00-</b>	<b>SFA DINNER AND SOCIAL</b>

## Thursday, June 9

<b>08:00-09:30</b> <i>Kustaa-Juhana</i>	<b>PLENARY SESSION</b> <i>Do probiotics work by modulating the gut microbiome?</i> <b>Samuli Rautava, University of Turku</b>  <i>The microbiome of the healthy and diseased lung. Is there a role for prebiotics or probiotics?</i> <b>Mike Surette, McMaster University</b>  <i>Impact of the circadian rhythm on microbiota and IBD</i> <b>Ali Keshavarzian, Rush University Medical Center, Chicago</b>
<b>09:30-09:45</b> <i>Crystal Hall</i>	<b>BREAK</b>
<b>09:45-11:30</b> <i>Kustaa-Juhana</i>	<b>ISAPP GROUP WRAP-UP</b> 15 minute report from each ISAPP discussion group
<b>11:30-14:30</b>	<b>LUNCH AND ACKNOWLEDGEMENTS/AWARDS</b>
<b>14:30-15:30</b>	<b>SFA EXECUTIVE MEETING</b>
<b>Evening</b>	<b>OPTIONAL BOAT TOUR: TURKU TO STOCKHOLM</b>



## Wednesday, June 8

<b>08:45-09:00</b> <i>Kustaa-Juhana</i>	<b>WELCOME AND POSTER AWARDS</b> Presentation of awards to SFA poster presenters
<b>09:00-10:30</b> <i>Kustaa-Juhana</i>	<b>PLENARY SESSION</b> <i>Natural fibers from food and their influence on the gut microbiota and human health</i> <b>Bruce Hamaker, Purdue University</b>  <i>Core genome, conservation of SCFA pathways among lactobacilli and bifidobacteria and implications for strain-specificity of probiotic effects</i> <b>Andy Benson, University of Nebraska</b>  <i>Prebiotic talk</i> <b>TBA</b>
<b>10:30-11:00</b> <i>Crystal Hall</i>	<b>BREAK</b>
<b>11:00-11:30</b> <i>Kustaa-Juhana</i>	<b>ISAPP INSIGHTS</b> 1. <i>Probiotics for at-risk populations: activities of Probiotics Standards Committee.</i> <b>Greg Leyer, UAS</b> 2. <i>ISAPP Science Translation Committee activities.</i> <b>Chris Cifelli, National Dairy Council</b> 3. <i>U.S. FDA oversight of human research.</i> <b>Mary Ellen Sanders</b>
<b>11:30-12:00</b> <i>Kustaa-Juhana</i>	<b>FEATURED INDUSTRY SCIENCE</b> Two 15min talks, TBA
<b>12:00-13:00</b> <i>Dining Room</i>	<b>LUNCH</b>
<b>13:00-17:00</b>	<b>CONCURRENT WORKSHOPS AND KNOWLEDGE EXCHANGE</b> SFA will break into workshop groups with different themes and topics. Full group will reconvene post-workshops to discuss.
<b>17:00-18:00</b>	<b>SFA AGM</b> Annual general meeting for all SFA members
<b>18:30-21:30</b> <i>Turku Castle</i>	<b>NETWORKING CONFERENCE DINNER WITH ISAPP</b> At the Turku Castle



## Appendix A: Program for the ISAPP meeting



### 2016 ISAPP Meeting Program

Turku Finland  
[Radisson Blu Marina Palace Hotel](#)  
 June 7-9, 2016

<b>Monday, June 6, 2016</b>	<b>Location</b>
<i>17:30-19:30 Board of Directors Meeting.</i> Chair: Karen Scott, University of Aberdeen	Eerik
<b>Tuesday, June 7, 2016</b>	
<i>8:30-19:00 Registration</i>	Lobby, 2 <sup>nd</sup> floor
<i>9:00 SFA poster session setup</i>	Crystal Hall
<i>9:00-12:00 Student and Fellow Association program.</i> Chair: Jean Macklaim, University of Western Ontario	Dining Room
<i>9:00-12:00 Continuous coffee break</i>	Crystal Hall
<i>9:00-10:30 Board of Directors + Industry Advisory Committee meeting.</i> Chair: Karen Scott and Saskia van Hemert, Winlove	Kustaa-Juhana
<i>10:45 – 13:15 Learning Forum.</i> Probiotic or prebiotic development path. Chair: Saskia van Hemert	Kustaa-Juhana
<i>10:45-11:15 Moving to clinical studies – what are the watch outs?</i> Eamonn Quigley, The Methodist Hospital and Weill Cornell School of Medicine	
<i>11:15-11:45 Minimizing bias when designing trials.</i> Dan Tancredi, University of California	
<i>11:45-12:15 Break</i>	
<i>12:15-12:45 EFSA update.</i> Seppo Salminen, University of Turku	
<i>12:45-13:15 How to approach preparing a successful dossier for an immune health claim on a food?</i> Ambroise Martin, former Chair of the EFSA NDA Panel	
<i>13:15-14:15 Lunch</i>	Restaurant Herttua
<i>14:15-14:45 Keynote Lecture.</i> The microbiome – it's more than just the 'bacteriome'. Colin Hill, University College Cork Chair: Glenn Gibson, The University of Reading	Kustaa-Juhana
<i>14:45-15:15 Hot Topic.</i> Early probiotic intake associated with reduced islet autoimmunity, a prospective cohort study. Ulla Uusitalo, Morsani College of Medicine, University of South Florida, Tampa	Kustaa-Juhana

Chair: Seppo Salminen	
<b>15:15-15:45 Hot Topic. What evidence does it take to substantiate non-drug claims? Lessons from Bayer v FTC.</b> Dan Merenstein, Georgetown University Medical Center Chair: Mary Ellen Sanders, ISAPP	Kustaa-Juhana
<b>16:00-19:30 Poster Session and Reception</b> , during which the Late Breaking News session will also occur.	Crystal Hall
<b>17:00 – 18:00 Late Breaking News.</b> Chair: Gregor Reid, University of Western Ontario. Preceded by and followed by poster session and reception.	Kustaa-Juhana
<b>Wednesday, June 8, 2016</b>	
<b>8:00-10:00 Registration</b>	Lobby, 2 <sup>nd</sup> floor
<b>8:45 Welcome. Presentation of Poster Session Awards.</b> Karen Scott, President ISAPP and Seppo Salminen, local host <b>9:00-10:30 Plenary session I.</b> Chair: Bob Hutkins, University of Nebraska Natural fibers from food and their influence on the gut microbiota and human health. Bruce Hamaker, Purdue University Core genome, conservation of SCFA pathways among lactobacilli and bifidobacteria and implications for strain-specificity of probiotic effects. Andy Benson, University of Nebraska Low FODMAP diet versus prebiotic supplement for alleviating IBS symptoms: a randomised, double-blind trial. Francisco Guarner, University Hospital Vall d'Hebron	Kustaa-Juhana
<b>10:30-11:00 Break</b>	Crystal Hall
<b>11:00-11:30 ISAPP Insights.</b> 10 min updates on key ISAPP initiatives. 1. Probiotics for At-Risk Populations: activities of Probiotic Standards Committee. Greg Leyer, UAS 2. ISAPP Science Translation Committee activities. Chris Cifelli, National Dairy Council 3. FDA oversight of human research in the United States. Mary Ellen Sanders	Kustaa-Juhana
<b>11:30 – 12:00 Featured Industry Science.</b> Chair: Saskia van Hemert Novel pre-clinical and clinical HMO research. Rachel Buck, Abbott Probiotics; controlling metabolic syndrome. Arthur Ouwehand, DuPont	Kustaa-Juhana
<b>12:00 Working lunch in discussion group rooms</b>	
<b>12:00–18:00 Breakout discussion groups</b>	
1. Colic Update: IPDMA and Mechanisms. Chairs, Michael Cabana and Dan Tancredi	Kustaa

2. Evidence-based expectations across a range of benefits for probiotics: How do they compare with standard interventions? Chairs, Dan Merenstein and Irene Lenoir-Wijnkoop	Herttua
3. Next generation probiotics. Chairs, Colin Hill, Paul O'Toole and Julian Marchesi	Juhana
4. Regulatory developments for probiotics and prebiotics in European Union – does it change the road to the market? Chairs, Seppo Salminen and Magnus Friberg	Katariina
5. Prebiotics, probiotics and common GI symptoms in the general population (not diseases). Chairs, Eamonn Quigley and Sarah Lebeer	Eerik
6. How do probiotics and prebiotics work at distant sites? Chairs, Samuli Rautava and Gregor Reid	Pietari
7. The culture of fermented foods, including prebiotic and probiotic aspects. Chairs, Bob Hutkins and Maria Marco	Kristina
<b>Continuous coffee break</b>	
<b>13:00-17:00 Student and Fellow Association program</b>	Dining Room
<b>18:30-22:00 Conference Dinner</b> (Bus departs hotel at 18:15 or 30 min walk along river, 2.4 km; return bus departs Castle at 22:00)	Turku Castle
<b>Thursday, June 9, 2016</b>	
<b>8:15-9:45 Plenary Session II.</b> Chair: Glenn Gibson Do probiotics work by modulating the gut microbiome? Lessons from clinical trials. Samuli Rautava, University of Turku The microbiome of the healthy and diseased lung. Is there a role for prebiotics or probiotics? Mike Surette, McMaster University Intestinal microbiota and circadian rhythms. Ali Keshavarzian, Rush University Medical Center, Chicago	Kustaa-Juhana
<b>9:45-10:15 Coffee Break</b>	Crystal Hall
<b>10:15 Wrap Up</b> (15 min x 7 group reports). Chair: Michael Cabana	Kustaa-Juhana
<b>12:00 Lunch</b>	
<b>13:00 Meeting adjourns</b>	
Board of Directors meetings. Chair: Karen Scott <b>13:30-15:30 Board Meeting</b> <b>16:30-18:30 Future Strategy Planning Meeting</b>	In transit





## Appendix B: Acknowledgements



### 2016 ISAPP Industry Advisory Committee Companies

*We are extremely grateful for the kind support of the 36 industry sponsors who, through their financial and scientific contributions and commitment to the scientific advancement of probiotic and prebiotic research have made the 2016 ISAPP meeting possible*

\*New members in 2016

Abbott Nutrition	Mondelez
Bayer*	National Dairy Council
Beneo/Suedzucker	NIZO
Biocodex	Nutricia
BioGaia	Pepsico*
BioK+ International	Pfizer
Calif. Dairy Research Found.	Pharmavite*
Chr. Hansens	Prenexus Health*
Clasado Limited	Probi AB
Danisco	Procter & Gamble
Danone	Protexin
DSM/i-Health	Sensus-Royal Cosun
Friesland Campina	Tate & Lyle*
Ganeden	UAS Laboratories
General Mills	Valio
Ingredion*	Winclove Probiotics
Lallemand	Yakult
Mead Johnson	Zespri

## Appendix C: 2016 ISAPP Meeting Participant List

Category	Last	First	Affiliation
IAC	Abdel-Aziz	Heba	Bayer Consumer Health
IE	Abrahamsson	Thomas	Linköping University
IE	Abreu	Ana Teresa	Gastroenterologist and Neurogastroenterologist
IE	Agréus	Lars	Karolinska Institutet
IE	Bailey	Michael	Nationwide Children's Hospital
IE	Bañares	Silvia	Universidad Abad Oliba - CEU
IAC	Benoit	Valerie	General Mills
IE	Benson	Andrew	University of Nebraska
IAC	Binda	Sylvie	Danone nutricia research centre Daniel carasso
IE	Bindels	Laure	Université catholique de Louvain
IAC	Boileau	Tom	PepsiCo
IE	Bubnov	Rostyslav	Zabolotny Institute of Microbiology and Virology, National Academy of Sciences of Ukraine
IAC	Buck	Rachael	Abbott Nutrition
BoD	Cabana	Michael	University of California, San Francisco
IAC	Canene-Adams	Kirstie	Tate & Lyle
IE	Chau	Kim	The Hospital for Sick Children
IAC	Chow	JoMay	Abbott Nutrition
IAC	Cifelli	Chris	National Dairy Council
IE	Collado	Maria Carmen	IATA-CSIC
IE	Cotter	Paul	Teagasc
IAC	Crittenden	Ross	Valio
IE	D'Amico	Frank	Duquesne University / UPMC-St. Margaret Hospital
IAC	de Montigny	Danielle	BioK+ International Inc.
IE	De Vos	Willem	Helsinki & Wageningen University
IAC	Drummond	Lynley	Zespri International Ltd.
IE	Ebell	Mark	University of Georgia
IAC	Fargier	Emilie	BIOCODEX
IE	Foligne	Benoit	Institut Pasteur de Lille
IE	Friberg	Magnus	Gulliksson Advocates
IE	Ganguli	Kriston	Massachusetts General Hospital/Harvard Medical School
IE	Gänzle	Michael	University of Alberta
BoD	Gibson	Glenn	University of Reading
IAC	Grattepanche	Franck	Yoplait/General Mills
IE	Guarner	Francisco	University Hospital Vall d'Hebron
IAC	Haldeman	Margaret	i-Health, Inc, a division of DSM

IE	Hamaker	Bruce	Purdue University
IE	Heeney	Dustin	University of California Davis
BoD	Hill	Colin	APC Microbiome Institute
IE	Hungin	Pali	Durham University
BoD	Hutkins	Bob	University of Nebraska
IE	Indrio	Flavia	University of Bari
IAC	Janusz	Michael	Procter & Gamble Inc
IE	Jermy	Andrew	Nature Microbiology
IAC	Jungersen	Mikkel	Pfizer Consumer Healthcare
IE	Keshavarzian	Ali	Rush University Medical Center
IE	King	Sarah	University of Cambridge
IE	Kort	Remco	TNO (Netherlands Organisation of Applied Scientific Research)
IAC	Kullen	Martin	DuPont
IE	Lähteenmäki-Uutela	Anu	Turku School of Economics
IE	Langella	Philippe	INRA
IAC	Larsson	Niklas	Probi AB
IAC	Le Guern	Marie Emmanuelle	BIOCODEX
IE	Lebeer	Sarah	University of Antwerp
IE	Lenoir-Wijnkoop	Irene	University of Utrecht
IAC	Leyer	Gregory	UAS Labs LLC
IE	Linder	Jeffrey	Brigham and Women's Hospital and Harvard Medical School
IAC	Magnusson Borg	Kristina	BioGaia AB
IE	Mannonen	Leena	Ministry of Agriculture and Forestry
IAC	Manurung	Sarmauli	Mead Johnson Nutrition
IE	Marchesi	Julian	Cardiff University/Imperial College London
IE	Marco	Maria	University of California, Davis
IE	Martin	Ambroise	University Claude Bernard Lyon I (retired)
IAC	Martoni	Christopher	UAS Labs LLC
BoD	Merenstein	Dan	Georgetown University
IAC	Meynier	Alexandra	Mondelez France R&D
IAC	Mody	Seema	DSM
IE	Moore	Michael	University of Southampton
IAC	Ndife	Louis	Pharmavite LLC

IE	O'Neill	Catherine	University of Manchester
IAC	Önning	Gunilla	Probi AB
IAC	Ota	Toshihisa	Yakult Europe
IE	O'Toole	Paul	School of Micro & APC Microbiome Institute
IAC	Ouwehand	Arthur	DuPont Nutrition & Health
IAC	Palacios	Alejandro	Probiotics International Ltd (Protexin)
IE	Pärtyy	Anna	Turku University Hospital
IAC	Pasin	Gonca	California Dairy Research Foundation
IE	Pihlanto	Anne	Natural Resources Institute Finland
IE	Pot	Bruno	Institut Pasteur de Lille
BoD	Quigley	Eamonn	Houston Methodist Hospital
IAC	Rai	Deshanie	Bayer Healthcare
IE	Rautava	Samuli	University of Turku
BoD	Reid	Gregor	Lawson Health Research Institute
IE	Ringel	Yehuda	Rabin Medical Center (RMC), Beilinson Hospital
IE	Ringel-Kulka	Tamar	UNC Chapel Hill
IAC	Roos	Stefan	BioGaia AB
BoD	Salminen	Seppo	University of Turku
BoD	Sanders	Mary Ellen	ISAPP
IE	Satokari	Reetta	University of Helsinki
IAC	Sauce	Christophe	Danone Research
IAC	Savignac	Helene	Clasado Biosciences Ltd
IE	Savino	Francesco	Regina Margherita Children's Hospital, University of Turin
IE	Schiller	Lawrence	Baylor University Medical Center
IAC	Schoterman	Margriet	FrieslandCampina Innovation
BoD	Scott	Karen	Rowett Institute of Nutrition and Health, University of Aberdeen
IE	Shane	Andi	Emory University School of Medicine
IAC	Shibata	Hideyuki	Yakult Honsha Co.
IAC	Ship	Noam	Bio-K+ International Inc.
IE	Smid	Eddy J.	Wageningen University
IE	Steidler	Lothar	Intrexon Actobiotics NV
IE	Sung	Valerie	Royal Children's Hospital, Murdoch Childrens Research Institute and University of Melbourne
IE	Surette	Michael	McMaster University
IE	Szajewska	Hania	The Medical University of Warsaw
IE	Tancredi	Daniel	University of California, Davis
IAC	ten Bruggencate	Sandra	NIZO food research
IAC	Theis	Stephan	BENEO

IE	Tuohy	Kieran	Fondazione Edmund Mach
IAC	Tuure	Tuula	Valio Ltd.
IE	Uusitalo	Ulla	University of South Florida
IAC	van Hemert	Saskia	Winlove Probiotics
IAC	van Hylckama Vlieg	Johan	Chr. Hansen
IE	Vandenplas	Yvan	UZ Brussel
IAC	Vaughan	Elaine	Sensus (Royal Cosun)
IE	Whorwell	Peter	University Hospital of South Manchester
IAC	Younes	Jessica	Winlove Probiotics