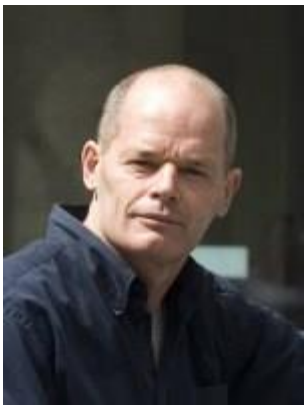
2014 ISAPP Meeting Report
June 18-12, 2014
In conjunction with Rowett Institute of Nutrition and Health and INRA
Aberdeen, Scotland

CONTENTS:

I. EXECUTIVE SUMMARY

The 2014 ISAPP meeting in Aberdeen, Scotland featured presentations on emerging topics involving probiotics and prebiotics in diet and the microbiota, animal nutrition and clinical developments. Additionally, small discussion groups explored new developments beyond the gut, the strength of evidence for probiotics and treatment of colic, mechanisms of probiotic and prebiotic function, path to market for novel probiotics and prebiotics and promising endpoints for health at the level of the microbiome. The meeting was held in conjunction with the Rowett Institute of Nutrition and Health and INRA meeting, Gut Microbiology: from Sequence to Function. This was an open registration meeting held June 16-19. ISAPP's specific role was organization of the lectures for the last day of this meeting, June 19, followed by an ISAPP-only, by-invitation event on June 20, comprising the traditional discussion group and wrap up sessions. The IAC Learning Forum was held Wednesday, June 18 on the topic of Nutrametabonomics, taught by Jonathan Swann, PhD from the University of Reading. The ISAPP-only meeting was attended by 99 delegates representing 20 countries (Australia, Belgium, Canada, Switzerland, Denmark, Germany, Spain, Finland, France, Ireland, India, Italy, Japan, The Netherlands, New Zealand, Poland, Sweden, Turkey, United Kingdom and United States). Fifty-seven of the meeting participants were invited experts, nine were ISAPP Board members and 33 were industry members of the ISAPP IAC. Follow up from the meeting is expected to result in publications from four of the five discussion groups (Group 1 (Reid), Group 2 (Cabana), Group 4 (Salminen), Group 5 (Walter). The details of the 3-day program are found in Appendix A. The Student and Fellow Association conducted a concomitant meeting. Their program included 25 attendees presenting posters, three SFA members shared their technical expertise in new emerging techniques relevant to probiotics/microbiome research with other SFA members, and two ISAPP members - one from academia and one from industry - gave talks about starting a research career in academia and alternative career paths in research. This meeting would not be possible without the support of many companies and the hard work of many people; they are acknowledged in Appendix B.

II. WELCOME FROM THE PRESIDENT



Welcome to Aberdeen and to ISAPP 2014. This year our program is a little bit different to the norm. We are starting with a Learning Forum organized for our industry members on "Nutrimetabonomics" on Wednesday. On Thursday we have a one day symposium jointly organised with the Rowett Institute of Nutrition and Health and INRA (as the last day of their 3 day meeting titled Gut Microbiology: from Sequence to Function), followed by the always popular Late Breaking News session (5-min talks and refreshments). ISAPP participants continue into day 3 (Friday) with five parallel Workshops in the morning and Workshop feedback in the afternoon. There is also a SFA poster session. As usual it's a very busy schedule, but in the evenings we also hope to have time for some social activities, including a ceilidh on the Thursday evening and an ISAPP-hosted social event at the Albyn pub (11 Albyn Pl in Aberdeen City – note recent change in venue for this event). For all soccer fans (football in the UK), the World Cup will also be played throughout the three days and I am sure there will be at least some people (Glenn?) interested in the outcome of the England-Uruguay game on the Thursday evening.

I will repeat what I said last year in this equivalent letter. Since taking over as President I have been amazed at the number of times I am 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 very different to most meetings - 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, and so the quality of the plenary speakers and Workshop participants is truly outstanding, while the limited overall numbers enhances the interactive nature of the meeting. ISAPP also engages with industry partners to select relevant topics for the Workshops and for the IAC Learning Forum. We also have an active Student and Fellows Association to encourage participation by the next generation of scientific leaders.

We are at a very exciting crossroads in the science of probiotics and prebiotics. We believe that organisations like ISAPP, which maintain scientific independence, will play an important role in keeping the debate focused on the best science. This will influence regulators, 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, especially Karen Scott (our stalwart Vice-President), who has taken on the task of organising this meeting on her home turf. We of course thank the scientists who give their time and efforts freely and our industry partners whose support makes it all possible and whose participation makes it worthwhile. I would pay special attention to the ISAPP Board, all leaders in their fields who give considerable time and effort to the many teleconferences and emails and phone calls required to keep ISAPP on track (a list of current Board members is provided further on in this letter). I particularly want to thank our Executive Science Officer, Dr Mary Ellen Sanders, who has given her customary exemplary leadership and organisational skills to make sure this meeting continues to operate to the highest scientific standards.

Once again, welcome to Aberdeen and enjoy the meeting,

Regards, Colin Hill

III. DISCUSSION GROUPS

Discussion Group 1. Beyond the gut – what's new?

The Centrome

Although we hardly need another 'omic' terminology, the central role that microbes have in successful human reproduction suggests a 'Centrome' concept. It has long been known that pathogenic microbes can prevent conception and induce early termination, while 'beneficial' microbes, especially lactobacilli, can help restore and maintain health in the vagina and cervix and potentially improve the chances of conception. Recently, two areas of research have added intrigue to the reproductive story.

The discovery of viruses in virtually all women and the potential interaction with bacteria in pregnancy suggests an evolutionary development, not one by chance or caused by sexually transmitted pathogens. While more studies are required on the reproductive virome, and this presents many challenges, animal studies have already shown the ability of viruses to influence fetal outcomes.

Secondly, the findings that the amnion and placenta are not sterile, but rather home to microbes, has widespread implications. For now, many do not believe the data and put it down to poor techniques and contamination. Others believe it is possible, and are willing to consider the implications 'if' the hypothesis is proven. Cynicism must be met with experimental precision, and just as it seemed impossible for bacteria to live in the stomach until science progressed to find them, so too do we expect that technological advances will uncover unexpected microbes doing unexpected things.* Evolution from microbes to humans have taken a long time, but it should not be a surprise to one day realise that the former are integral to life of the latter, indeed central, starting at reproduction. Research that prizes out which organisms are critical, what they do even in low numbers and in an almost quiescent state to shape the human structure and lifespan, will truly be transcending.

While other topics were discussed, including the gut-brain, oral microbiome, and the mammary gland, each linked back to reproductive health and the transfer of microbes to the newborn. The tools used in 'omic' research are beginning to allow us to understand if microbes are universal in the human body, what they do and when their metabolic activity has major consequences for the host. The ability of some probiotic and prebiotic products to influence the host, even if only subtly changing the microbiome readout, provides us with seeds that may improve the complex construction process of human renewal and evolution.

**The TrES Project discovered the largest-ever exoplanet, a gas giant, 1,400 light-years away, nestled closely to its star in the constellation Hercules, so large it theoretically should not exist - but it does!*

Participants:
Ansell, Juliet; Brigidi, Patrizia; Burton, Jeremy; Contractor, NIkhat; Duncan, Sylvia; Fargier, Emilie; Hill, Colin; Kollmann, Tobius; Lebeer, Sarah; McBain, Andrew; Mor, Gil; O'Neil, Cath; Reid, Gregor; Rodriguez, Jean-Miguel; Van Hemert, Saskia.

Group 1 Photo.

Discussion Group 2. Infant colic: Is there enough clinical evidence to support probiotic interventions?
Chairs: Michael Cabana, Dan Tancredi

Group #2 focused on the current evidence to support probiotic interventions to treat colic. The work group consisted of international experts on colic, probiotics, the gut microbiota, meta-analysis and biostatistics. There are several ongoing and completed trials around the world investigating the role of probiotics in colic. The results of these studies have varied; however, there are subtle differences in their study design. The investigators formally met to collaborate on a meta-analysis of individual patient data (IPDMA), on the topic of probiotics in the treatment of infant colic. Randomised controlled trials of interventions are even more powerful when they are synthesized into an individual patient data meta-analysis by pooling together a large set of data. Unlike 'traditional' meta-analyses, this study design will allow us to carefully examine subgroups and better understand the role probiotics may play in colic. Significant progress was made regarding the selection of co-primary outcomes, covariates and pre-specified sub-analyses. This analysis of the raw data of combined studies is very robust and considered by most the highest level of evidence. The group plans to publish a manuscript describing the IPDMA protocol. This protocol will be the first IPDMA of a probiotic intervention for children. In addition, several other IPDMA studies are planned for analysis and publication.

Participants:
Cabana, Michael; D'Amico, Frank; Davis, Steven; Deshpande, Girish; Indrio, Flavia; Johnson, Katja; Mentula, Silja; Oozeer, Raish; Savino, Francesco; Sung, Valerie; Szajewska, Hania; Tancredi, Daniel.

Group 2 Photo.

Group 3. New insights into how probiotics and prebiotics do what they do. Chairs: Michiel Kleerebezem, Peter van Baarlen

There is substantial knowledge on the global effect of probiotics on consumer physiology, but mechanistic insight is scarce, and it is strictly spoken not necessary to have this insight. However, mechanistic insight would make it possible to identify probiotic effector molecules and the corresponding human targets, providing quality control and selection criteria for products, rational searches for novel bioactives, and host biomarkers and rational targets and endpoints that could be investigated in clinical trials.

At present, most preclinical work is done using animal and in vitro models; due to lack of mechanistic insight, translation of models to human is extremely challenging. We do know some of the challenging features of human responses to probiotics, these include strongly intertwined immune and metabolic pathways and tissue biology involving different immune and metabolic cell types. Translation of function of conserved molecular pathways between animal models and human appears to be worthwhile pursuing, even though genetic variation betweens humans is much higher compared to inbred mice. This huge inter-person variation means that there is a need for stratification of the general population using high-resolution, unbiased -omics technologies. Pre- and probiotics should remain healthy food for the entire population, with specific health benefits for specific subgroups ("responders"). As future avenues for research, we considered that prebiotics should be redefined, maybe as "bioactives that

have a beneficial effect on microbial ecosystem functions" including interference with pathogens. Next-generation probiotics might include resident commensals that are often better colonizers and persisters in human intestinal tract, some of which (e.g. Faecalibacterium prausznitzii) have been shown to confer strong anti-inflammatory effects on their host. Novel probiotics should expand, not replace, existing interventions, and should display general functionalities in different humans. It might be feasible to come to well-defined, quality-controlled formulations of "autochtonous" microbe mixtures to replace fecal transplant regimes.

Participants:
Chichlowski, Maciej; Delzenne, Nathalie; Hooiveld, Guido; Hutkins, Bob; Kleerebezem, Michiel; Langella, Philippe; Lyra, Anna; Martin, Rocio; Millette, Mathieu; Panwar, Harsh; Sako, Tomoyuki; Sanders, Mary Ellen; Sylvie, Binda; Tuohy, Kieran; van Baarlen, Peter; Van Sinderen, Douwe; Wells, Jerry.

Group 3 Photo.

Group 4. Path to market for novel probiotics and prebiotics. Chairs: Ian Rowland, James Heimbach

Discussion began with consideration of what is meant by “novel” with regard to probiotics and prebiotics. It was recognized that novelty can reside within the identification and characterization of the substance or microorganism or within its use—i.e., its function or its target population. After much discussion, we agreed that novelty is a regulatory concept rather than a scientific one. Further, it is a binary variable as applied by regulators (i.e., there is no allowance for “degree of novelty”). Novelty does not necessarily correlate with a substance’s status as a “functional” (i.e., biologically active) or “traditional” (i.e., having a technical effect on the food, but innocuous to the consumer of the food) food additive. Additionally, novelty does not correlate with safety.

It was agreed that the only difference in safety assessment between a novel and non-novel food ingredient or microorganism is that safety of the former must be based entirely on scientific procedures with no support from history of use. There was some discussion of cases in which history of use stands alone, with no perceived need for scientific support; examples include QPS microorganisms and substances regarded as GRAS in the U.S. based on use prior to 1958.

After discussion of paths to market in the EU, the U.S., Canada, and Japan, it was widely felt that only Canada and Japan had truly come to grips with the challenges of regulating functional food ingredients and recognizing that they occupy a niche separate from both foods and drugs. While the U.S. GRAS approach is widely admired, it is recognized that it suffers from the need to apply scientific approaches developed to assess the safety of non-biologically active ingredients to ingredients that are not only biologically active, but pharmacologically active. The Japanese "Foods for Specified Health Uses (FOSHU)" has been successfully applied for many years now, while Canada's "Natural Health Products" program is still in its infancy, but was viewed by the participants in the discussion group as well conceptualized.

Participants:
Banares, Silvia; Cartwright, Peter; Gerritsen, Jacoline; Heimbach, Jim; Koenig, David; Kumar, Himanshu; Lalonde, Melanie; Murphy, Maeve; Nomoto, Koji; Patterson, Angela; Richardson, David; Rowland, Ian; Salminen, Seppo; Schoterman, Margriet; Scott, Karen; Theis, Stephan; Verhagen, Hans; Young, Anthony.

Group 5. Microbiome and health: promising endpoints for interventions. Chairs: Jens Walter, George Fahey

In clinical trials, an endpoint is an event or outcome that can be measured objectively to determine whether the intervention being studied is beneficial. For practical reasons, surrogate endpoints or biomarkers predictive of the final outcome are often evaluated. The topic of our discussion was to identify promising endpoints for interventions that target the microbiome to improve human and animal health. The discussion was primed by eight presentations that covered both human and animal oriented topics. In the first session, presenters discussed promising endpoints for infectious and inflammatory (Dan Merenstein), metabolic (Gary Wu), and immune (Daniel Peterson) diseases in humans. Following, Fancisco Guarner presented findings from a now published MetaHIT study on IBD, highlighting the association between community diversity and membership and disease conditions. The second session focused on promising endpoints for prebiotic/probiotic interventions in canine and feline (Kelly Swanson), equine (Murray), aquaculture (Gatlin) species, to enhance animal health. After an open discussion, there was broad agreement that many diseases are associated with changes in the composition and function of the microbiota (referred to as dysbiosis). However, direct cause-effect relationships between these disturbances and the development of disease have not been established yet. Our discussion panel felt that, at the current point, there is insufficient evidence to recommend changes in gut microbiota patterns as endpoints in interventions. Instead, accepted primary endpoints for human diseases that provide evidence to support a health claim (for example glucose deregulation, inflammatory cytokines, dyslipidemia, hypertension, adiposity) should be used in human trials. The panel recommended to be specific when describing primary outcomes and to consider regulatory issues when choosing endpoints. Although the panel felt that microbiome patterns are not yet reliable endpoints, many accepted risk markers of human disease have been linked to the gut microbiota, providing a clear rational for targeting the microbiota for both prevention and treatment of disease. In addition, emerging knowledge on disease-associated dysbiotic patterns (e.g. diversity, anti-inflammatory microbes and metabolic functions) should be used to identify targets for interventions, and intervention that target the microbiome should be informed by ecological theory. Finally, a characterization of the microbiome should be a component of intervention trials to (1) confirm dysbiotic patterns, (2)

determine if dysbiotic shifts can be redressed, and (3) test if these changes are associated with disease outcomes. Together with functional studies in animals, these association studies in humans might result in mechanistic understanding that could aid therapeutic advances in the treatment of disease.

Participants:
Allen, Stephen; Attwood, Graeme; Barlow, Janine; Bisanz, Jordan; Cifelli, Chris; Duar, Rebbeca; Fahey, George; Gatlin, Delbert; Gratz, Silvia; Guarner, Francisco; Hansen, Brian; Hayashi, David; Jacobs, Heidi; Louis, Petra; Manurung, Sarmauli; Marchesi, Julian; Merenstein, Dan; Meynier, Alexandra; Morrison, Mark; Mosoni, Pascale; Murray, Jo-Anne; Peterson, Daniel; Rezzonico, Enea; Robertson, Anna-Karin; Russell, Wendy; Swanson, Kelly; van Hylckama Vlieg, Johan; Vermeiren, Joan; Walter, Jens; Wu, Gary.

Group 5 Photo.

IV. IAC FORUM PROGRAM

Nutrimetabonomics Workshop, Wednesday June 18, 2014
Course prepared and taught by: Dr Jon Swann (j.r.swann@reading.ac.uk)

Metabonomics is a powerful systems biology approach that simultaneously measures the low-molecular-weight compounds in a biological sample, enabling the metabolic status of a biological system to be characterized. Such biochemical profiles contain latent information relating to inherent parameters, such as the genotype, and environmental factors, including the diet and gut microbiota. Over the past two decades metabonomics, being driven by hypothesis-generation rather than hypothesis-led, has emerged as a powerful tool for studying the metabolic activity of the gut microbiota and understanding their influence on the host metabolic system. As technology advances, so does our ability to resolve the metabolome and we are continually gaining greater insights into the biochemical connectivity between the host and its enteric residents. Nutrimetabonomics, represents an arm of metabonomics with a focus on studying molecular interactions between the diet and the global metabolic system. This approach is being increasingly applied to study the effects of pre- and pro-biotics on the global host metabolic system and their potential to impact on host health and disease. The proposed workshop aims to provide an overview of the nutrimetabonomic workflow. After introducing key concepts in data generation using conventional nuclear magnetic resonance (NMR) spectroscopy or mass spectrometry (MS) techniques, it will focus on data analysis and interpretation. This will provide participants with sufficient understanding to interpret and evaluate metabonomic data.

Data generation

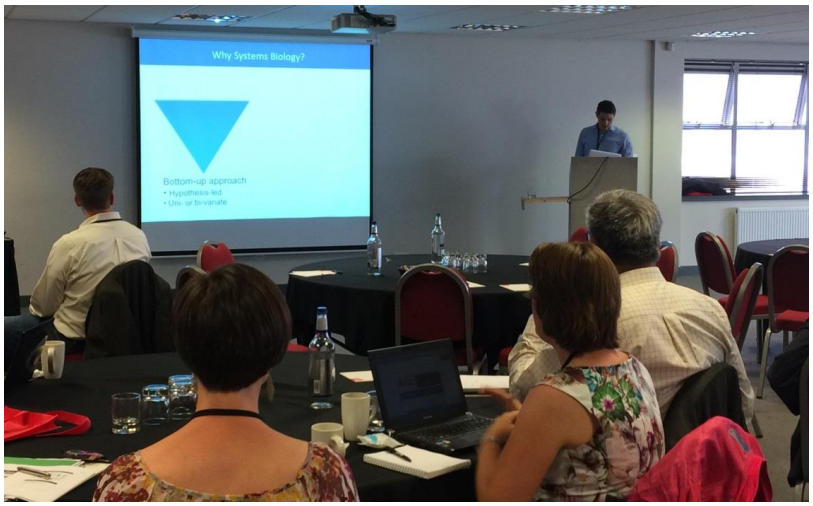
- Nutrimetabonomics: what is it?
- Experimental design
- Main analytical platforms

Data analysis using multivariate statistics

- Describing data using unsupervised tools
- Getting more from your data using supervised tools

Interpretation

- From metabolites to biology
- Online databases and tools



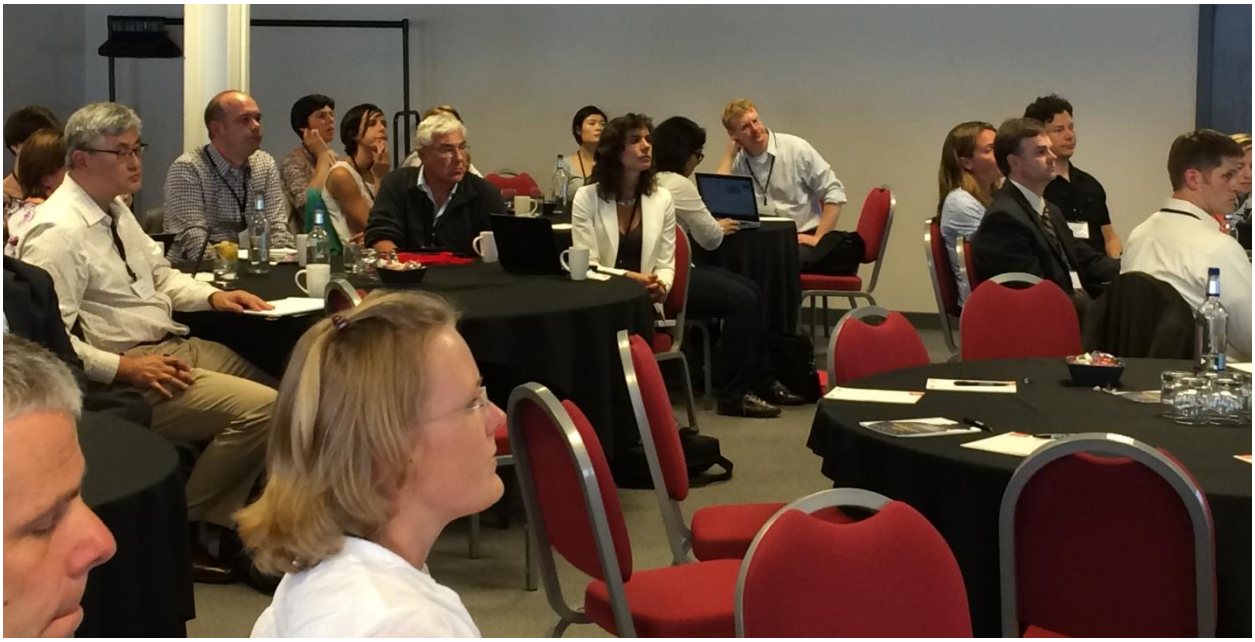
Jon Swann

V. PHOTOS

Board of Directors Meeting

In front (l-r): Michael Cabana, Karen Scott, Juliet Ansell; In back: Seppo Salminen, Colin Hill, George Fahey, Glenn Gibson, Mary Ellen Sanders, Gregor Reid

Industry Advisory Committee +Board of Directors Meeting



VI. STUDENT AND FELLOWS ASSOCIATION PROGRAM

The 2014 SFA conference took place in Aberdeen, Scotland, UK from June 18-20th, in conjunction with the ISAPP meeting which was held in collaboration with the Rowett-INRA meeting, Gut microbiology: From Sequence to Function. This provided the SFA members and excellent opportunity to get in contact with the ISAPP scientists and industry members as well as interact with other scientists in the field from all around the world. This year 25 attendees presented posters. In addition, three SFA members shared their technical expertise in new emerging techniques relevant to probiotics/microbiome research to other SFA members. Also, two ISAPP members, one from academia and one from industry, gave talks about starting a research career in academia and alternative career paths in research. The full SFA conference program and the abstracts are available at ISAPP SFA 2014 conference booklet.

APPENDIX A. PROGRAM FOR THE ISAPP MEETING

2014 ISAPP Meeting
Program
June 18-20, 2014
Aberdeen Exhibition and Conference Centre
Aberdeen Scotland UK

ISAPP's meeting is in conjunction with the Rowett/INRA meeting, "Gut Microbiology: from Sequence to Function," held June 16-19, 2014, with a full scientific program on June 17 and 18. ISAPP lectures held Thursday, June 19, as indicated below, comprise a jointly organized program by ISAPP/Rowett/INRA on the final day of the Rowett/INRA meeting. The program on June 20 is an ISAPP-only program.

Wednesday, June 18
12.30-13.30 ISAPP Board of Directors meeting and lunch (ISAPP Board only)
13.30-14.30 IAC meeting
14.30-15.30 Board meeting + IAC meeting (ISAPP Board plus all IAC representatives only)
15.15-15.45 Refreshment break
15.30 – 17.30 IAC Learning Forum: Nutrimetabonomics Workshop (see program description below)
19.30 – 20.00 Conference Dinner for those attending Rowett/INRA meeting
Thursday, June 19. Lecture Sessions, Joint Program with ISAPP and Rowett/INRA
Diet and the Microbiota – Chairs: Harry Flint and Glenn Gibson
• 9.00-9.25 Dietary modulation of the microbial metabolome. Wendy Russell, Rowett Institute of Nutrition and Health, University of Aberdeen, UK
• 9.25-9.50 Gut microbiota in Hadza hunter gatherers, adaptation to a Paleolithic lifestyle. Patrizia Brigidi, Università di Bologna, Italy
• 9.50-10.15 Towards understanding and predicting dietary responsiveness of the human intestinal microbiota. Anne Salonen, University of Helsinki, Finland
• 10.15-10.40 Young investigator talk. Perinatal maternal transfer of indigenous bacteria occurs through amniotic fluid and breast milk in infants born by elective caesarian section. Juhani Aakko, University of Turku, Finland
10.40-11.10 Refreshment break (Boyd Orr)
Clinical Highlights - Chairs: Michael Cabana and Annick Bernalier
• 11.10-11.35 The PLACIDE trial: unexpected findings regarding a microbial preparation in the prevention of antibiotic-associated diarrhoea in the elderly. Stephen Allen, Swansea University, UK
• 11.35-12.00 Oral Health Applications for Probiotics. Andrew McBain, University of Manchester, UK
12.00-13.30 Lunch (Boyd Orr)
Clinical Highlights (cont)
• 13.30-13.55 Topical probiotics as novel treatments for skin in health and disease. Cath O'Neill,

University of Manchester, UK
• 13.55-14.20 Routine probiotics for preterm neonates for prevention of Necrotizing Enterocolitis (NEC). Girish Deshpande, University of Sydney, Australia
• 14.20-14.45 Hot topic: Regulation of host metabolism by bacterial bile acid modification in the gut: implications for the rational selection of probiotics. Cormac Gahan, Alimentary Pharmabiotic Centre, University College Cork, Ireland
Probiotic and Prebiotic Applications in Aquaculture and Companion Animal Species - Chairs: George Fahey and Karen Scott
• 14.45-15.10 Probiotic and prebiotic applications in aquaculture. Del Gatlin, Texas A&M University, USA
• 15.10-15.35 Probiotic and prebiotic applications in equids. Jo-Anne Murray, University of Edinburgh, Scotland
15.35-16.05 Refreshment break (Boyd Orr)
Probiotic and Prebiotic Applications in Aquaculture and Companion Animal Species (cont)
• 16.05-16.30 Probiotic and prebiotic applications in dogs and cats. Kelly Swanson, University of Illinois, USA
16.30-16.55 ISAPP consensus panel report: Appropriate Use of the Term “Probiotic”. Colin Hill, University College Cork and Alimentary Pharmabiotic Centre, Ireland
16.55-17.10 Meeting wrap up (introduce 2016 Rowett/INRA meeting)
17.30-18.30 Late Breaking News - Chair: Gregor Reid
20.00-24.00 End of Conference Ceilidh
Friday, June 20
8.30 – 14.00: Discussion groups
1. Beyond the gut – what’s new? Chairs: Gregor Reid, Juliet Ansell
2. Infant colic: Is there enough clinical evidence to support probiotic interventions? Chairs: Michael Cabana, Dan Tancredi
3. New insights into how probiotics and prebiotics do what they do. Chairs: Michiel Kleerebezem, Peter van Baarlen
4. Path to market for novel probiotics and prebiotics. Chairs: Ian Rowland, James Heimbach
5. Microbiome and health: promising endpoints for interventions. Chairs: Jens Walter, George Fahey
8.30 – 14.00: SFA meeting
Lunch (12.30) and AM Break (10.30) – SFA and ISAPP
14.00-15.30 ISAPP Students and Fellows Association poster session (manned posters), refreshments
15.30-17.30: Wrap Up session - Chair: Mary Ellen Sanders
19.00: ISAPP Social Pub Event The Albyn, 11 Albyn Place, Aberdeen

APPENDIX B. ACKNOWLEDGMENTS

This meeting would not be possible without the support and hard work of a large group of people and companies, which are acknowledged here.

IAC partners (led by Chris Cifelli and Saskia van Hemert)
ISAPP is fortunate to be sponsored by probiotic and prebiotic companies around the globe, who value research and discovery. Through their generous support, ISAPP has the funds to conduct its annual meetings. ISAPP expresses appreciation for the support provided by the 2014 IAC companies.

Abbott Nutrition
Beneo/Suedzucker AG
Biocodex
BioGaia
BioK+ International
Cargill
CDRF
Chr Hansen
Clasado
Cosucra
Dairy Management Inc.
Danone Research
DuPont/Danisco
Friesland Campina
Ganeden
General Mills
Kimberly Clark
Mead Johnson
Merck
Metagenics
Mondelez
Nestle
NIZO
Nutricia
Pfizer
Probi AB
Procter & Gamble
Probiotics International Ltd. (Protexin)
UAS Laboratories
Valio
Winclove
Yakult

ISAPP Board
Colin Hill (President), Karen Scott (Vice-President), Michael Cabana (Secretary), George Fahey (Treasurer), Glenn Gibson (Past President), Todd Klaenhammer, Gregor Reid, Seppo Salminen, Eamonn Quigley and Mary Ellen Sanders (Executive Science Officer). IAC representatives (non-voting) to the board: Chris Cifelli and Saskia van Hemert.

Instructor and Course Developer for the IAC Learning Forum, *Nutrimetabonomics Workshop*
Dr Jon Swann, University of Reading UK

Discussion group chairs, especially non-board members (in bold) whose leadership was essential for this program:
Group 1: Gregor Reid, Juliet Ansell
Group 2: Michael Cabana, **Dan Tancredi**
Group 3: **Michiel Kleerebezem, Peter van Baarlen**
Group 4: **Ian Rowland, James Heimbach**
Group 5: **Jens Walter**, George Fahey

APPENDIX C: 2014 ISAPP MEETING PARTICIPANT LIST

Last Name	First Name	Affiliation	ISAPP category
Allen	Stephen	College of Medicine, Swansea University	IE
Ansell	Juliet	Zespri International	BoD
Attwood	Graeme	AgResearch Ltd	IE
Banares	Silvia	legal advisor	IE
Barlow	Janine	Probiotics International Ltd	IAC
Bisanz	Jordan	Western University/ Lawson Health Research Institute	IE
Brigidi	Patrizia	Dept. Biotechnology and Pharmacy, University of Bologna	IE
Burton	Jeremy	University of Western Ontario	IE
Cabana	Michael	UCSF	BoD
Cartwright	Peter	Probiotics International Ltd. (Protexin)	IE
Chichlowski	Maciej	Mead Johnson Nutrition	IAC
Cifelli	Chris	Dairy Research Institute	IAC
Contractor	Nikhat	Metagenics	IAC
Cudmore	Sally	Alimentary Pharmabiotic Centre	IE
D'Amico	Frank	Duquesne University / St. Margaret Hospital	IE
Davis	Steven	Abbott Nutrition	IAC
Delzenne	Nathalie	UnivesitÃ© catholique de Louvain	IE
Deshpande	Girish	Nepean Hospital Sydney, University of Sydney Australia	IE
Dinleyici	Ener Cagri	Eskisehir Osmangazi University Faculty of Medicine	IE
Duar	Rebbeca	University of Alberta	IE
Fahey	George	University of Illinois at Urbana-Champaign	BoD
Fargier	Emilie	Biocodex	IAC
Flint	Harry	Rowett Institute of Nutrition and Health	IE
Gahan	Cormac	Alimentary Pharmabiotic Centre	IE
Gatlin III	Delbert	Texas A&M University System	IE
Gerritsen	Jacoline	Winclove Probiotics	IAC
Gibson	Glenn	University of Reading	BoD
Gratz	Silvia	Rowett Institute of Nutrition and Health, University of Aberdeen	IE
Guarner	Francisco	University Hospital Vall d'Hebron	IE
Hansen	Brian	Pfizer	IAC
Hayashi	David	Mondelez International	IAC
Heimbach	Jim	JHeimbach LLC	IE
Hill	Colin	University College Cork	BoD

Hooiveld	Guido	Div. Human Nutrition, Wageningen University	IE
Hutkins	Bob	University of Nebraska	IE
Indrio	Flavia	Department of Pediatric University of Bari	IE
Jacobs	Heidi	Cosucra Groupe Warcoing	IAC
Johnson	Katja	NestlÃ©	IAC
Kleerebezem	Michiel	NIZO food research / Wageningen University	IE
Koenig	David	Kimberly-Clark Corporation	IAC
Kollmann	Tobias	University of British Columbia	IE
Kumar	Himanshu	Functional Food Forum	IE
Lalonde	Melanie	Bio-K Plus International inc.	IAC
Langella	Philippe	Inra	IE
Lebeer	Sarah	University of Antwerp	IE
Leyer	Gregory	UAS Laboratories LLC	IAC
Louis	Petra	Rowett Institute of Nutrition and Health, University of Aberdeen	IE
Lyra	Anna	Dupont	IAC
Manurung	Sarmauli	Mead Johnson Nutrition	IAC
Marchesi	Julian	Cardiff University	IE
Martin	Rocio	Nutricia Resarch	IAC
McBain	Andrew	The University of Manchester	IE
Mentula	Silja	National Institute for Health and Welfare (THL)	IE
Merenstein	Dan	Georgetown University	IE
Meynier	Alexandra	Mondelez International R&D	IAC
Millette	Mathieu	Bio-K Plus International inc.	IAC
Möllstam	Bo	BioGaia	IAC
Mor	Gil	YALE UNIVERSITY SCHOOL OF MEDICINE	IE
Morrison	Mark	University of Queensland, Diamantina Institute	IE
Murphy	Maeve	General Mills Inc	IAC
Murray	Jo-Anne	University of Edinburgh	IE
Nomoto	Koji	Yakult Honsha, Co. Ltd.	IAC
O'Neill	Cath	University of Manchester	IE
Oozeer	Raish	Nutricia Research	IAC
Panwar	Harsh	Guru Angad Dev Veterinary and Animal Sciences University	IE
Patterson	Angela	University of Aberdeen	IE
Peterson	Daniel	Johns Hopkins School of Medicine, Pathology Department	IE
Reid	Gregor	Lawson Health Research Institute	BoD
Rezzonico	Enea	Nestle Research Center	IAC
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Sako	Tomoyuki	Yakult Europe B.V.	IAC
Salminen	Seppo	University of Turku	BoD
Salonen	Anne	University of Helsinki	IE
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Swann	Jon	University of Reading	IE
Swanson	Kelly	University of Illinois at Urbana-Champaign	IE
Sylvie	Binda	Danone Research	IAC
Szajewska	Hania	The Medical University of Warsaw, Department of Paediatrics	IE
Tancredi	Daniel	University of California, Davis	IE
Tennila	Julia	DuPont Nutrition and Health	IAC
Theis	Stephan	BENEO Institute	IAC
Tuohy	Kieran	Fondazione Edmund Mach	IE
van Baarlen	Peter	Host-Microbe Interactomics, Wageningen University	IE
van Hemert	Saskia	Winclove Probiotics	IAC
Van Hylckama Vlieg	Johan	Danone Research	IAC
Van Sinderen	Douwe	University College Cork	IE
Verhagen	Hans	National Institute for Public Health and the Environment (RIVM)	IE
Vermeiren	Joan	Cargill R&D centre Europe	IAC
Walter	Jens	University of Alberta	IE
Wells	Jerry	Wageningen University	IE
Wu	Gary	University of Pennsylvania/USA	IE
Young	Anthony	Kleinfeld, Kaplan, and Becker LLP	IE