2010 ISAPP Meeting Report
August 28-30, 2010
Castelldefels, Spain

The International Scientific Association for Probiotics and Prebiotics (ISAPP) convened its 8th meeting August 28-30, 2010 at the Gran Hotel Don Jaime, Castelldefels, Spain. Hosted by Dr. Francisco Guarner, this by-invitation meeting was attended by 123 participants, including 41 scientists from the ISAPP Industry Advisory Committee and invited delegates, from 23 countries, including Russia, Argentina, Brazil, China, and India, as well as from North America and Europe. This year, ILSI-Europe was invited to be part of the program due to their established Probiotic and Prebiotic Taskforces and the progress they have made in scientific issues related to scientific substantiation of health claims. The program began with a plenary session featuring lectures on the human microbiome projects, the role of indigenous prebiotics and probiotics in human milk, the relationship between gut microbes and metabolic syndrome, pili as a mediator of intimate host-microbe interactions and the role of commensal and pathogenic bacteria on programming of the neonatal immune response. Presentations from ILSI-Europe Taskforce representatives included "Guidance for Substantiating the Evidence for Beneficial Effects of Probiotics: Results from the ILSI Probiotic Task Force" and "From Prebiotic Concept to Prebiotic Effects: Metabolic and Health Benefits. ILSI Europe Prebiotic Taskforce Report." In addition, an introduction to a survey that ILSI-Europe conducted on key probiotic questions was presented.

After the plenary lectures, a Late Breaking News session was held. This session is comprised of 5 minute lectures (maximum of 3 slides) which aim to be provocative, and highlight new data, new perspectives or new concerns related to the probiotic and prebiotic industries. The topics included the economic benefits due to public health cost savings from supplementation of infant formula with prebiotics, bovine oligosaccharides, bottlenecks for biomarker validation in clinical studies, a description of the new Probiotics European Scientific Foundation, the Scientific American editorial equating functional foods with snake oil (Snake oil in the supermarket. September 20, 2010, Scientific American, p. 30. http://www.scientificamerican.com/article.cfm?id=snake-oil-in-the-supermarket) and our Past-President's "bucket list" including re-emphasizing adherence of companies to the FAO/WHO definition of what a probiotic is and what the term requires.

ISAPP board of directors. Back row, L-R: Karen Scott (Treasurer), George Fahey (Member-at-Large), Arthur Ouwehand (Junior IAC representative), Francisco Guarner (Program Chair), Glenn Gibson (President), Nathalie Delzenne (Member-at-Large), Colin Hill (Member-at-Large), Gregor Reid (Past President). Front row, Duane Charbonneau (Senior IAC Representative), Michael Cabana (Secretary), Mary Ellen Sanders (Executive Director), Delphine Saulnier (SFA President). Missing: Todd Klaenhammer (Vice-President).

Discussion Group

On the second day of the meeting, all meeting participants participated in one of six discussion groups. Discussion group members are listed in Table 1. Key conclusions from these groups follow.

Group 1. Where Pathogenesis and Commensalism Meet. Chair: Todd Klaenhammer, Co-chair: Colin Hill.

Whereas pathogens that cause infectious disease harbor uniquely distinct properties from commensals and probiotics, pathogens and commensals do meet in the gut and face a number of shared environmental challenges. These include survival through gastric juice and bile, competition with the existing microbiota, attachment/retention in the intestinal mucosa, interactions with the immune system, and impacts to health – positively for commensals and negatively for infective pathogens. As a result, the two groups share very similar strategies for survival and competition in this niche, such as pili, fimbriae, bile salt tolerance mechanisms, IgA proteases, IgA binding proteins, and oxidative stress genes. Because many of these factors were first discovered in pathogens, they are often referred to as virulence factors on the basis that inactivation usually impacts the virulence of the pathogen. However, it is not surprising that many innocuous commensal bacteria also share these features. With the application of more genome sequencing and high throughput technologies, it is likely that many genes encoding structures or strategies previously associated with 'virulence' will be identified in commensal bacteria. It is important that a clear distinction is retained between true 'virulence factors' (pathogen specific factors such as toxins which damage the host, or internalins which facilitate entry into host cells) and those shared survival and colonization strategies employed by all gut-associated bacteria. This discussion group proposed that a more accurate description of these shared structures or strategies would be "survival, tolerance, or competition" factors.

Group 2. Gut Microbiota and Disease. Chair: Francisco Guarner, Co-chair: James Versalovic.

Presentations and discussion in group 2 aimed at describing characteristics of a "normal" gut microbiota in terms of structure and functions, i.e. microbial composition and activities that are considered to be commonly present in human subjects. A second aim of the group was to review clinical conditions associated with dysbiosis, i.e. associated with abnormal characteristics of the gut microbiota. This double approach was considered as the practical way of gathering the relevant information in order to eventually define a "healthy" gut microbiota. The group included a number of scientists actively involved in projects from the International Human Microbiome Consortium (IHMC, www.human-microbiome.org). These projects are currently going on in the US, Europe and China. The MetaHIt study suggests that up to 3-4 million microbial genes and about 20,000 functions encoded by these genes are present in the human gut microbiota (Qin et al. 2010). The NIH Human Microbiome Projects have investigated in depth samples from healthy individuals. These studies have clearly detected age related differences between healthy children and adults. Data from different studies on IBS, IBD, type II diabetes and obesity are providing information about consistent changes in gut microbiota composition. This information can be applied to rational remodeling or "tailoring" of human-associated microbial communities and their associated functions (Preidis and Versalovic. 2009). The group concluded that it is still too early to define the structure of a "healthy" gut microbiota. However, markers associated with disease (microbial signatures) are expected to be available soon. These markers may eventually be useful as diagnostic tools. Prospective studies will be needed to provide information about cause-effect relationships.

- Qin J, Li R, Raes J, et al. 2010. A human gut microbial gene catalogue established by metagenomic sequencing. Nature 464(7285):59-65.
- Preidis GA, Versalovic J. 2009. Targeting the human microbiome with antibiotics, probiotics, and prebiotics: gastroenterology enters the metagenomics era. Gastroenterology 136(6):2015-31.

Group 3: Bioactives, the Grand Canyon of our Field. Chairs: Nathalie Delzenne and Glenn Gibson

Each group participant was invited to choose a topic related to bioactivity of probiotics and prebiotics.

Galactoglucomannan oligosaccharide [GGMO]. This is an oligosaccharide that has demonstrated functional properties in animal foods. This new candidate prebiotic is isolated from waste materials. The unique galactoglucomannan oligosaccharides may play a role in digestive health and immune function. Animal and in vitro models have been used for testing temulose. The GGMO is a promising prebiotic as based on current evidence. Human trials are to be considered for the future.

Bacteriocin from Lactobacillus salivarius UCC118: The bacteriocin-producing probiotic *Lactobacillus salivarius* UCC118 alters the composition of the gut microbiota in diet-induced obese mice. Research has focused on (i) understanding the links between diet, gut health, inflammation and metabolic function and (ii) the identification of food components that impact the development of obesity and associated metabolic abnormalities and the underlying mechanisms by which these effects occur. UCC118 reduced Actinobacteria but increased Bacteroidetes in a model with diet induced obesity.

Gnotobiotic mouse models. This presentation addressed the role of the gut microbiota in host physiology and metabolism using gnotobiotic mouse models. Research is especially focused on the mechanisms by which the gut microbiota contributes to the pathogenesis of obesity, insulin resistance, diabetes and atherosclerosis. Mice kept under germ-free conditions have reduced adiposity compared

with colonized mice. Lipidomics demonstrated that the gut microbiota had global effects on the host's lipid metabolism, characterized by increased hepatic and adipose triglyceride levels.

Butyrate. Butyrate is an important short chain fatty acid metabolite produced during anaerobic fermentation by gut bacteria, which helps maintain a healthy gut. Butyrate is the preferred energy source for gut epithelial cells, and induces apoptosis of cancer cells. Butyrate production also helps to maintain a slightly acidic colonic pH, thereby assisting in pathogen exclusion. Some of the more abundant gut bacteria produce butyrate, including *Faecalibacterium prausnitzii* and *Roseburia* spp. Other bacteria synthesise butyrate from other bacterial metabolites including lactate. Production of butyrate is substrate-dependent, and growth on starch and fructo-oligosaccharides (prebiotics) results in butyrate production.

Bile acid signatures. This research explored the influence of the gut microbiota on the bile acid signatures of host tissue compartments and the potential for the gut microbiota to modulate the signalling capacity of these trans-genomic metabolites. This work utilised a targeted High pressure liquid chromatography-mass spectroscopy approach to characterise the bile acid signatures in the liver, kidney, heart and plasma of conventional, germ-free, and antibiotic-treated rats. In addition, work explored the impact of binge-drinking on cognition in humans. The aim of this study was to screen a wide range of urinary metabolites using a 1H nuclear magnetic resonance (NMR) spectroscopy-based metabonomic approach to establish the relationship between metabolic effects of alcohol consumption and cognitive impairment. The initial phase of this study has demonstrated an association between urinary markers and specific forms of cognitive impairment (spatial working memory). These markers are also linked to gut microbial metabolism.

Gut flora and metabolic syndrome. The field of interest is the role of the gut microbiota in the development of metabolic disorders, such as obesity, type 2 diabetes and low grade inflammation. Research covers the fundamental mechanistic aspects of the host-gut microbes interactions, as well as the impact of nutritional modulation of the gut microbiota by using pre- and probiotics. Special attention is given to the role of the endocannabinoid system and its impact on the control of gut barrier function and adipogenesis. Future strategies on the role of probiotics and prebiotics in metabolic syndrome were discussed.

Immunomodulation. The aim is to isolate and identify the effector molecule produced by *L. reuteri* that is capable of inhibiting TNF production from activated human myeloid cells. This has been done using a combination of mass spectroscopy and NMR techniques. The second objective is to understand the mechanism of probiotic-mediated TNF suppression.

Phenylpropanoid compounds. Current research focuses on phenylpropanoid-derived compounds in the diet that are released and transformed by the colonic microbiota to form anti-inflammatory metabolites. Particular compounds of interest are ferulic acid and its derivatives. These compounds undergo de-esterification hydrogenation, demethylation and dehydroxylation by the gut bacteria. Species responsible for these molecular transformations are being described with a view to development as potential probiotics.

Gut flora and xenobiotics. Research focuses on the metabolic interactions between the gut microbiota and its host metabolism, with a particular interest on the liver and the brain. The complex relationships between drugs, drug metabolism and the gut flora was described and the effect of dietary modulation.

In this context, antibiotics as a means to modulate the host metabolism through alteration of the microflora and xenobiotic metabolism may lead to new research on pro and prebiotics.

Fatty acids and the gut. The focus was on the interactions between fatty acids and commensals in the gastrointestinal tract. This interaction between administered microbes and fatty acids could result in a highly effective nutritional approach to the therapy of a variety of inflammatory and neurodegenerative conditions. For the specific case of conjugated linoleic acid, its anti-proliferation effect was described. Species of bifidobacteria may produce conjugated linoleic acid at varying levels.

Immunoglobulins. Urinary metabolic and mucosal immunoglobulin responses of the pig to nutritional intervention around the weaning period indicated that *B. lactis* has a differential effect on both of these parameter sets depending on the initial weaning diet, even after a dietary washout period.

Antiadhesive activities of prebiotics. Prebiotics are generally thought of as fermentation substrates, manipulating the microbiota composition and activity. Oligosaccharides can, however, act as antiadhesive agents, preventing pathogens from binding to host cell receptors. These oligosaccharides are being developed as an approach to therapy, typically involving complex multivalent derivatives. There is, however, accumulating evidence that galacto-oligosaccharides also have the ability to prevent pathogens from binding to cells, although the evidence for an effect *in vivo* is currently lacking. This type of activity could, however, be a feature in design of future prebiotic oligosaccharides.

The group concluded with general discussion to ascertain whether bioactives were capable of inducing similar health benefits to probiotics and prebiotics and/or explaining mechanisms of effect. The question was raised as to whether bioactive compounds could be a new market with nutrition/medical applications.

Group 4: Probiotics and Prebiotics in Perinatal Nutrition. Chair: Michael Cabana; Co-chair: David Mills

This group discussed the increasing use of probiotics and prebiotics by infants and young children. One effect of these dietary agents is changes in the infant microbiota. Attempts to define the 'normal' or 'typical' infant microbiota, metagenome and metabolome were discussed. There are many confounding factors to these efforts, such as mode of delivery, antibiotic exposure, breastmilk exposure and gestational age. In addition, there are no accepted standards for stool collection. Stool itself may be an imperfect representation of the microbiota; however, given the limitations of current technology, it would not be ethical to use more invasive methods in well infants. Definition of the infant microbiota may allow us to find correlations with infant disease states, as well as develop biomarkers for clinical trials. Experiences were shared among group participants on attempts to manipulate the gut microbiota by probiotics and prebiotics. In addition, human breast milk as a delivery agent for prebiotics and microbes was discussed. The potential of adding human milk oligosaccharide mimics to infant formula was also discussed. In addition, the potential long-term impact of infant formula products supplemented by probiotics and prebiotics on long-term infant health was considered.

Group 5. Health Benefit Claims for Probiotic and Prebiotic Products. Chair: Mary Ellen Sanders, Co-Chair: Seppo Salminen.

This group discussion opened with brief descriptions of differences among regulatory frameworks for probiotics in the United States, Canada, Europe, China and India. All these geographical regions had in common the principle of consumer protection, although the means to this end varied. There was

agreement that health claims should be substantiated by generally accepted scientific evidence, taking into account the totality of the available scientific data, and weighing this evidence to determine the strength of the support.

Of note, although both the US and Europe allow disease risk reduction claims, in the US foods have not been allowed to be used to reduce the risk of acute diseases, such as colds or flu, but in Europe this is in theory possible, if evidence is provided. India is in the process of developing specific probiotic guidelines and it is still possible to provide scientific input into this process.

Discussion about the wording of health claims emphasized that this is a very difficult endeavor. It often entails translating complicated scientific findings into claims that can be understood accurately by average consumers. Companies must first define what the most important message is, and then use wording that is simple, not vague, confusing or misleading and that accurately reflects the strength of the scientific evidence.

Another issue that was of concern regarding developing substantiation for claims is this issue of biomarkers. In Europe, this has a special importance, as the regulation specifically indicates that a change in a risk factor must be established in addition to convincing evidence directly on the endpoint, if needed. However, in the field of probiotics and prebiotics, few valid biomarkers are available for the types of endpoints these substances target. Furthermore, considering that regulators are focused on the role of foods in health, there is a great need for valid approaches for evaluating health instead of disease. Biomarkers would also be very useful for identifying subpopulations of responders and non-responders, to increase the focus of human studies.

Important themes that emerged during this discussion:

- Regarding the difficulty in measuring health, the focus of studies could be in measurement of homeostasis. From a statistical point of view, if a study were able to minimize the variation around the mean for a specific measure (even in the absence of changing the mean), it could be a reflection of improved health, assuming a biological rationale exists that tighter control of the parameter is physiologically advantageous. In other words, lessening the fluctuation around an individual's biomarker could be interpreted as contributing to improving health. This novel idea emphasizes the importance of homeostasis as a focus of studies on health, and provides a rationale based in solid statistical theory as a way to measure this.
- Another issue that emerged was the frustration about regulatory "boxes." Although scientists would agree that there is a continuum between health and disease, in regulatory terms these are distinct states. Likewise, there are numerous examples of foods having pharma-like properties, such as reducing the risk of acute infections. However, some regulatory authorities see such actions as only valid for "drugs." The consequences of such constraints can be significant for scientists and the studies they design, for consumers and how they might benefit from certain products.

Group 6. Probiotics and Prebiotics to Combat Enteric Diarrheal Diseases and HIV in the Developing World. Chair: Gregor Reid, Co-Chair: Dan Merenstein.

This discussion group comprised experts from the developing world, others who had worked on projects there, and participants committed to helping with this major morbidity and mortality problem. All were positive about the evidence to date and potential for probiotics and prebiotics to help lower the burden of disease and suffering in a cost effective manner that could engage and empower local people in developing countries such as Tanzania, Kenya, Rwanda, South Africa, Ghana, India, Bangladesh, Pakistan,

China, Brazil and Peru. This group aimed to build upon ISAPP's commitment to consider issues in developing countries and attempt to bring probiotic and prebiotic concepts and products to these regions. Furthermore, the group was interested in a follow-on discussion from the Gates Foundation meeting in London, UK (January 2010), which concluded that no funding was yet warranted for use of probiotics for diarrhea in developing countries.

The group addressed the following issues:

1. Determine the scientific rationale for using probiotics and/or prebiotics to combat diarrheal diseases and/or HIV/AIDS in the developing world.
2. Write practical recommendations for prebiotics and probiotics on issues such as choice of: probiotic strains, prebiotic, dosages, appropriate target diseases, test populations. Other issues to address include how to deliver the products in challenging settings, how to offset the cost of the treatment and use of unique, effective models.

With an eye to the issues stated above, there were three objectives for the session:

1. Try to set up collaborations leading to projects in the developing world.
2. Write a roadmap for how to bring probiotics to a developing country, even if only for research and not for profit.
3. Create project ideas that can identify plausible mechanisms whereby "biotics" combat diarrheal diseases and HIV.

Studies were proposed that would address the impact of pro/prebiotics on HIV/AIDS or on diarrheal diseases. Specific issues of best measurement endpoints, study population, confounders and other issues were considered.

Recommendations were made on how to facilitate progress in this area.

1. Products calling themselves 'probiotic' are slowly becoming available in developing countries, but the majority have never been clinically tested and shown to confer a health benefit. This is a major failing of companies and government agencies. Either products should be appropriately tested or the word 'probiotic' removed from the labels.

2. The group discussed studies showing that probiotics and prebiotics could provide viable tools for management of diarrheal diseases and HIV/AIDS.

3. Funding for research and young scientists is a major problem in the developing world. The suggestion was made that ISAPP could solicit funds from its Industry Advisory Committee members to set up a program to provide funding (~$40,000-50,000) for:

   (i) Two studies per annum for developing world scientists, possibly in collaboration with ISAPP-selected scientists from developed countries, targeting this research area.

   (ii) Fund an African junior faculty member, to enable him/her to spend 1 year working in an established program to learn methodologies, grant writing, collaboration skills, and how to conduct independent research. This person would be selected by his/her department, with the stipulation that the department would provide ongoing research support.

Participants in discussion group 6: Probiotics and Prebiotics to Combat Enteric Diarrheal Diseases and HIV in the Developing World (see Table 1).

Student and Fellow Association

The newly formed Student and Fellow Association convened two programs: a poster session and "Opportunities Everywhere" informal session.

Poster session Student and Fellow Association (SFA)

Eight young researchers who were awarded travel grants to attend the meeting presented their research as posters. Subjects ranged from mucosal immunity and Crohn's disease to HIV and the developing world.

- Annett Klinder, University of Reading, United Kingdom "Higher fruit and vegetable consumption increased butyrate producing bacteria in *Faecalibacterium prauznitzii* in human volunteers."
- Ruben Hummelen, Lawson Health Research Institute, Canada "Deep sequencing of the vaginal microbiome among women with HIV."
- Claire Merrifield, Imperial College, United Kingdom, "Weaning Diet Initiates a Sustainable Metabolic Reprogramming Event in the Pig that Impacts the Action of *Bifidobacterium lactis"*
- Alicia Murcia, Hospital Vall d´Hebron, Spain "The mature dendritic cell subpopulation is augmented in the intestinal lamina propria of Crohn´s disease patients"
- Carissa Thomas, Baylor College of Medicine, United States "Probiotic *Lactobacillus reuteri* suppresses TNF through inhibition of TAB1 and downstream MAPK pathways"
- Maria Alejandra Diaz, Baylor College of Medicine, United States: "Characterization of *Lactobacillus* spp. Isolated from *Tursiops truncatus* for use as Dolphin Probiotics"
- Marc Monachese, Lawson Health Research Institute, Canada "Potential new applications for probiotics in the developing world"

The following promising young researchers were selected to receive the travel grant but were unfortunately not able to attend:

- Alireza Shenavar Masouleh, University of Tehran, Iran, “Molecular Identification of *Leuconostoc mesenteroides* and *Enterococcus faecium* in Persian Sturgeon.”
- Valentina Tremaroli, Sahlgrenska University Hospital, Sweden, “Linking immunity and metabolism: microbial signalling through GPR43 and expression of iNOS in the mouse intestine”

“Opportunities Everywhere” session

With an astonishing picture of Barcelona in the background, and the glorious (and blocking) view of chair Ruben Hummelen on the fore ground, the SFA held its first seminar targeted specifically for students. Five scientists, who survived all the mistakes that we (students and fellows) are still about to make, contributed to the seminar by sharing their “life-lessons” and experiences. The first speaker, Gregor Reid, emphasized the value of having an external advisor, separate from your supervisor, who may be out of your own field of research, to provide advice and feedback with important decisions.

Michael Cabana gave great examples how in larger multidisciplinary projects the assembly of a team of people who are top notch in their own specific field may be the most important part of a project. The advice of Fredrik Bäckhed on how to survive in increasingly multidisciplinary teams was illuminating: learn different (scientific) languages but stick to what you are best at. Also, we were alerted to the importance of developing our own independent scientific profile, distinct from your former boss. The challenge is taking something with you from your postdoctoral experience that you can independently develop into your own area of expertise. In that way, a fruitful collaboration with your supervisor is still possible and you have the chance to develop an independent profile.

John McCormick challenged us with the question of whether any of us have followed through with an idea that we thought was great, but which our supervisor disagreed with. Two people lit up the session explaining that they have been Bohemians, which meant that they were ready as independent scientists. Also, John advised to only dare to dream about your own lab if you absolutely love your work.

Remco Kort inspired us not to feel limited by doing only what is possible within your group or company as there are many possibilities to blaze your own path by starting your own company or organization. Remco explained that there are many advantages in industry, such as the quick turn over of interesting ideas and projects. However, because of the customer- or market-driven nature of industry, it makes it difficult to develop and maintain your own unique area of expertise.

Students meet with professional ISAPP members to during the "*Opportunities Everywhere" session*

Extra-Curricular Activities

The participants of ISAPP 2010 did not miss the opportunity to experience the Mediterranean Sea. After the discussion groups adjourned, all participants hopped on busses for the short 1 mile trip to the sandy beach and blue water. Team activities including Pictionary drawn in the sand, volleyball, soccer, brain teasers, relay races and a treasure hunt were organized. Prizes were awarded at the evening dinner. The following were haikus written under time constraints from the competing teams:

Ten surfers floating boards
Surrounded by lots of ISAPP researchers playing
Football, volleyball, treasure hunt, swimming

Nude sunbathing
Clothes in potato chip bag
Lying on rocks

The beach was so exotic
But my gut was way too chaotic
So I took my probiotic

Volleyball players
Hitting the ball like crazy
Impressing the chicks

We saw some winners
Ruling the whole freakin' beach
Despite being Dutch

She wears a large hat
Blowing her whistle loudly
Focused on the day

Mad Spanish lady
Blows her top at ISAPP champs
Running relay races

ISAPP meeting participants enjoy activities on the beach

Sand Pictionary

Soccer

Relay races

Team Orange displays team spirit!

Table 1. Discussion group members.

Last Name	First Name	Affiliation	Country
Discussion group 1. Where pathogenesis and commensalism meet			
Antonsson	Martin	Probi AB	Sweden
Charbonneau	Duane	Procter & Gamble	USA
Christensen	Jeffrey	Chr. Hansen	Denmark
Daly	Charlie	University College Cork	Ireland
Hill	Colin	University College Cork	Ireland
Hutkins	Bob	University of Nebraska	USA
Klaenhammer	Todd	North Carolina State University	USA
Lahtinen	Sampo	Danisco Health & Nutrition	Finland
Lamoureux	Maryse	Agropur	Canada
McCormick	John	University of Western Ontario	Canada
Nes	Ingolf F.	Norwegian University of Life Sciences	Norway
Perdigon	Gabriela	CERELA	Argentina
Peterson	Daniel	University of Nebraska-Lincoln	USA
Pridmore	David	Nestlé	Switzerland
Sako	Tomoyuki	Yakult Europe	the Netherlands
Satokari	Reetta	University of Turku, Finland	Finland
Sleator	Roy	Cork Institute of Technology	Ireland
Discussion group 2. Gut microbiota and disease			
Bienenstock	John	McMaster Brain-Body Institute	Canada
Ehrlich	S. Dusko	INRA	France
Eiberger	Inna	Merck Selbstmedikation GmbH	Germany
Guarner	Francisco	University Hospital Vall d'Hebron	Spain
Haimet	Florence	INRA	France
Hunter	Kirsty	Nottingham Trent University	England
Klinder	Annett	University of Reading	England
Madduri	Krishna	The Dow Chemical Company	USA
Manichanh	Chaysavanh	University Hospital Vall d'Hebron	Spain
Martini	Peggy	Kraft Foods	USA
Menon	Ravi	General Mills Inc	USA
Murcia Muñoz	Alicia	Institut de Recerca, Hospital Vall d´Hebron	Spain
Ouwehand	Arthur	Danisco	Finland
Qin	Junjie	Beijing Genomics Institute	China
Ringel	Yehuda	University of North Carolina at Chapel Hill	USA
Rowland	Ian	University of Reading	England
van Hemert	Saskia	Winclove	the Netherlands
van Hylckama Vlieg	Johan	Danone Research	France
Versalovic	James	Texas Children's Hospital	USA
Discussion group 3. Bioactives, the Grand Canyon of our field			
Bäckhed	Fredrik	University of Gothenburg	Sweden
Bosscher	Douwina	Cargill R&D	Belgium
Cani	Patrice D.	Université Catholique de Louvain	Belgium

Chow	JoMay	Abbott Nutrition	USA
Claus	Sandrine	Imperial College	England
Delzenne	Nathalie	Université Catholique de Louvain	Belgium
Fahey	George	University of Illinois	USA
Gibson	Glenn	University of Reading	England
Lathrop Stern	Lori	Pfizer Consumer Healthcare	USA
Lichtenwald	Kathy	The Dow Chemical Company	USA
Meeuws	Sarah	Winclove	the Netherlands
Meheust	Agnes	ILSI Europe	Belgium
Merrifield	Claire	Imperial College	England
Miller	Barbara	Procter & Gamble	USA
Möllstam	Bo	BioGaia AB	Sweden
Murphy	Maeve	General Mills Inc	USA
Murphy	Eileen	University College Cork	Ireland
Rastall	Robert	The University of Reading	England
Russell	Wendy	Rowett Institute of Nutrition and Health	Scotland
Russell	Mike	Mead Johnson Nutrition	USA
Saulnier	Delphine	ISAPP Student and Fellow Association	USA
Scott	Karen	Rowett Institute of Nutrition and Health	Scotland
Swann	Jonathan	Imperial College London	England
Thomas	Carissa	Baylor College of Medicine/Texas Children's Hospital	USA
Tremaroli	Valentina	Wallenberg Laboratory at Sahlgrenska	Sweden
Discussion group 4. Probiotics and Prebiotics in Perinatal Nutrition			
Cabana	Michael	UCSF	USA
Connolly	Eamonn	BioGaia AB	Sweden
Davis	Steven	Abbott Nutrition	USA
Donovan	Sharon	University of Illinois	USA
Mills	David	University of California	USA
Ringel-Kulka	Tamar	University of North Carolina at Chapel Hill	USA
Ross	Paul	Teagasc Food Research Centre	Ireland
Stahl	Bernd	Danone Centre for Specialised Nutrition	Germany
Szajewska	Hania	The Medical University of Warsaw	Poland
Veereman	Genevieve	Free University Brussels	Belgium
Discussion group 5. Health benefit claims for probiotic and prebiotic products			
Ambrosetti	Lara	Ginsana SA	Switzerland
Bañares	Silvia	University Abat Oliva	Spain
Duffy	Linda	National Institutes of Health	USA
Durmont	Frederic	Lallamand SAS	Switzerland
Fletcher	Reg	Kellogg Europe Trading Ltd	Ireland
Gueimonde	Miguel	Asturian Dairy Products Institute	Spain
Gupta	Rajesh	Biocodex USA	USA
Heimbach	Jim	JHeimbach LLC	USA
Hinkel	Ulrika	Boehringer Ingelheim GmbH	Germany
Jankovic	Ivana	Nestlé	Switzerland

Kozianowski	Gunhild	Beneo Institute	Germany
Kumar	Ashok	Manager - LifeScience Advisory Group	India
Lähteenmäki-Uutela	Anu	University of Turku	Finland
Larsson	Niklas	Probi AB	Sweden
Lenoir-Wijnkoop	Irene	Danone Research	France
Leyer	Gregory	Danisco USA	USA
Macfarlane	Sandra	University of Dundee	Scotland
Mackle	Tami	Pfizer Consumer Healthcare	USA
Morelli	Lorenzo	Institute of Microbiology UCSC	Italy
O' Rourke	Raymond	Food Lawyer	Ireland
Palou	Andreu	University of Balearic Islands	Spain
Polzin	Kayla	Cargill, Inc.	USA
Pot	Bruno	Institut Pasteur Lille	France
Rijkers	Ger	UMC Utrecht and St. Antonius Hospital	the Netherlands
Salminen	Seppo	Functional Foods Forum	Finland
Sanders	Mary Ellen	Dairy & Food Culture Technologies	USA
Sanz	Yolanda	Spanish National Research Council (CSIC)	Spain
Schoterman	Margriet	FrieslandCampina Domo	the Netherlands
Tancredi	Daniel	UC Davis	USA
van Loveren	Henk	National Institute of Public health and the Environment	the Netherlands
Walker	Donald Carey	Mead Johnson Nutrition	USA
Welch	Rob	University of Ulster	Northern Ireland
Zhao	Jia	Yakult Europe	the Netherlands
Discussion group 6. Probiotics and prebiotics to combat enteric diarrheal diseases and HIV in the developing world.			
Cunningham-Rundles	Susanna	Weill Medical College of Cornell University	USA
Diaz	Maria Alejandra	Baylor College of Medicine	USA
Ermond	Eric	Nestec SA	Switzerland
Guerrant	Richard	University of Virginia School of Medicine	USA
Hummelen	Ruben	Erasmus University Medical Center	the Netherlands
Kemperman	Robèr	Unilever R&D	the Netherlands
Kerac	Marko	UCL Centre for International Health & Development / Valid International	England
Kort	Remco	TNO Quality of Life	the Netherlands
Merenstein	Dan	Georgetown University	USA
Monachese	Marc	Lawson Health Research Institute	Canada
Panigrahi	Pinaki	University of Nebraska Medical Center	USA
Ramakrishna	Balakrishnan	Christian Medical College Vellore	India
Reid	Gregor	Lawson Health Research Institute	Canada
Safdar	Nasia	University of Wisconsin-Madison	USA
Shane	Andi	Emory University School of Medicine	USA
Sheveleva	Svetlana	Institute of Nutrition Moscow	Russia
Trois	Livia	Grupo de Apoio a AIDS Pediatric, Children's Hospital Conceicao	Brazil

8th Meeting of the
International Scientific Association for Probiotics and Prebiotics
August 28-30, 2010
Gran Hotel Rey Don Jaime, Castelldefels, Spain

PROGRAM

Friday, August 27
20.00. IAC/BOD garden dinner
Saturday, August 28
8-9:30. Board of Directors meeting (BOD only)
9:30 – noon. Student and Fellow Association "Opportunities Everywhere" session (SFA members and other interested attendees)
10:30. Coffee break
9:30-10:30. IAC-only meeting (IAC-only)
10:30-noon. IAC+BOD meeting (Only ISAPP Board + IAC members)
Noon – 13:30. Lunch (All)
13:30 – 17:00. Plenary session (All) (Abstracts available at http://isapp.net/meeting_page.asp)
13:30 – 14:00. Update on the Human Microbiome Projects. Dusko Ehrlich, Current Chair of Steering Committee of International Human Microbiome Consortium (Francisco Guarner, host)
14:00 – 14:30. Human Milk: Role of indigenous prebiotics and probiotics. Sharon Donovan, University of Illinois, USA (George Fahey, host)
14:30-15:00. Relationship between gut microbes and metabolic syndrome. Fredrik Backhed, Wallenberg Laboratory, Sahlgrenska University Hospital, Göteborg, Sweden (Nathalie Delzenne, host)
15:00-15 :30. Break
15:30-16:00. Pili as a mediator of intimate host-microbe interactions – comparisons among pathogens, commensals and probiotics. Reetta Satokari, University of Turku, Finland (Todd Klaenhammer, host)
16:00-16:30. Effect of Commensal and Pathogenic Bacteria on Programming of Neonatal Immune Response. Susanna Cunningham-Rundles, Weill Cornell Medical College, New York (Gregor Reid, host)
16 :30-16:50. Guidance for substantiating the evidence for beneficial effects of probiotics: Results from the ILSI probiotic task force. Arthur Ouwehand, Danisco
16:50-17:10. From Prebiotic Concept to Prebiotic Effects: Metabolic and Health Benefits. ILSI Europe Prebiotic Taskforce Report. Bernd Stahl, Danone

17:15 - 18:00. SFA Poster Session, with authors.
18:00 – 19:30. Late breaking news/rapid fire session (Gregor Reid, chair)
19.30 – 19.45. Introduction to "Probiotic Q&A" (Agnes Meheust, ILSI Europe)
20:00. Dinner - Buffet dinner (All)
Sunday, August 29
9:00 – 16:00. 6 discussion/breakout groups (all participants divided among these 6 groups)
1. **Where pathogenesis and commensalism meet.** Chair: Todd Klaenhammer, Co-chair: Colin Hill.
2. **Gut microbiota and disease.** Chair: Francisco Guarner, Co-chair: James Versalovic.
3. **Bioactive compounds - the Grand Canyon of our field**. Chair: Nathalie Delzenne; Co-Chair: Glenn Gibson.
4. **Prebiotics and probiotics in perinatal nutrition**. Chair: Michael Cabana, Co-Chair: David Mills.
5. **Health benefit claims for probiotic and prebiotic products**. Chair: Mary Ellen Sanders, Co-Chair: Seppo Salminen.
6. **Probiotics and prebiotics to combat enteric diarrheal diseases and HIV in the developing world.** Chair: Gregor Reid, Co-Chair: Dan Merenstein.
16.00-20.00. Group activity (All)
20:00. Dinner (All)
Monday, August 30
8:30 AM – noon. Wrap up session – reports from all 6 discussion groups (All) – adjourn meeting
Noon – 13:30. Lunch (All)
13:30 – 15:30. Special IAC/BOD meeting on claims substantiation (IAC, BOD and special invitees only)
14.00 – 17.00. SFA visit to Lab of Dr. Francisco Guarner. Students/fellows only.
15:30 – 16:30. Board of Directors meeting (BOD only)
20.00. Dinner. Transportation will be arranged (IAC + BOD; ILSI – RSVP required)