



2008 Annual Report

International Scientific Association for Probiotics and Prebiotics

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www.isapp.net

Contents

Introduction

Message from the President

2009 Objectives

Highlights of 2008 ISAPP Activities

2008 Board of Directors

ISAPP Publications to-date

Appendix A: Summary of 6th International ISAPP Workshop, London Ontario Canada

Appendix B: Summary of ISAPP-sponsored meetings in 2008

Appendix C: Consumer Guidelines for Probiotics

Appendix D: Consumer Guidelines for Prebiotics

Introduction

ISAPP is an international non-profit collaboration of scientists dedicated to advancing the science of probiotics and prebiotics. The mission statement of ISAPP is: To engender and disseminate information on high quality, multidisciplinary, scientific investigation in the fields of probiotics and prebiotics, and to advance the development of scientifically substantiated, health-promoting probiotic and prebiotic products worldwide. ISAPP is the only scientific organization dedicated specifically to probiotics and prebiotics, bringing together scientists from all pertinent disciplines, including food science, microbiology, immunology, biochemistry, nutrition, molecular biology and medicine. As a scientific society, ISAPP strives to have all activities focused on science, not the promotion of any specific commercial products.

For additional details, see website www.isapp.net



Message from the President, Dr. Gregor Reid

This was a year of tremendous consolidation as an organization. Board members and people who have participated actively in ISAPP events were at the forefront of the field through numerous high profile peer-reviewed publications, media interviews, events organized and conferences at which they were keynote speakers. There was also unprecedented interaction with industry partners. Agencies such as the FDA, NIH, Health Canada, and organizations such as ILSI, IDF, IPA, USP and others called upon ISAPP to provide input into various issues throughout the year. The Lancet response to the controversial Utrecht report epitomized our leadership and determination to uphold the standards of probiotic and prebiotic research.

We had an outstanding workshop in November, once again in London Canada, which produced active discussion, excellent recommendations and once again retained the camaraderie that

has become an ISAPP trademark. Student involvement which started at our 2007 UK meeting continued at this event, and showcased the talented young scientists who are entering this area. There is much anticipation for the Sackler Symposium at the National Academy of Sciences venue in Irvine CA this November, preceding the 7th annual ISAPP meeting. Made possible through the efforts of Todd Klaenhammer and Jeff Gordon, this will be an outstanding event. As in the U2 song – better get on your boots!

As always, a big thank you to Mary Ellen for all her hard work behind the scenes. The new web site and its regular updates are appreciated, as are the reminders of jobs undone and the detail she puts into everything going on with ISAPP. Thanks to Karen for keeping the treasury in the black, allowing us to contribute to various activities around the globe. In Jim, we have a Secretary whose organization of regular conference calls, reports and continuous hard work make a big difference. Francisco deserves a lot of credit for working with the American Gastroenterology Association and partners in India to organize the Delhi conference which was a real success. Natalie's presentation at ISAPP was excellent and her enthusiasm is refreshing. We welcomed Mike onto the Board, which is great as he comes with new ideas, a clinical slant and a desire to see the organization continue its leadership role. Glenn has accepted to be the next ISAPP President, which is terrific. He is such a highly respected scientist who leads by example and by his wicked North East English humour. We look forward to more fun at future ISAPPs.

2009 Objectives

The new year is upon us and I would say we have three goals for 2009.

1. We need to grapple with and provide real scientific leadership with **regulatory issues** including health claims, and the scientific evidence that can support them. The former involves governmental organizations such as FDA, EU, Health Canada, Anvisa Brazil, and the latter relates to how probiotics and prebiotics work, and what biomarkers are known.
2. **Education** is a major gap on many fronts: the media, healthcare professionals, industry and the lay public. ISAPP will be looking at web 2 social media as one way to bridge this gap, as well as continuing to provide entry points for media dialogue and input into conferences to disseminate knowledge. Through the Industry Advisory Committee and the excellent leadership of Elaine Vaughan and Duane Charbonneau, as well as liaisons with IPA, we can work on ensuring industry undertakes the research necessary to verify the reliability and efficacy of their products.
3. Perhaps most important of all, ISAPP must, and will, bring **exciting science and clinical outcomes** research to the forefront. Scientific advances are the base from which we can understand how current products work, and how future products can be made available to benefit human and animal health. Such advances will come from researchers in all the continents, and in many diverse disciplines. We are committed to promoting these efforts as best we can, and by holding another conference that opens new doors and new eyes to the future.

Highlights of 2008 ISAPP Activities

- The ISAPP Industry Advisory Committee was comprised of an all-time-high number of research-oriented industry members. Twenty-four companies in all joined the 2008 IAC. Furthermore, for the first time, the IAC met separately from the Board of Directors to discuss issues of relevance to the scientific advancement of the fields of probiotics and prebiotics. Dr. Elaine Vaughan, industry representative to the ISAPP Board of Directors, provided insightful leadership for this activity.
- In an ongoing effort to reach beyond North America and Europe, ISAPP supported meetings in India and Indonesia (see Appendices for reports).
- ISAPP provided scientific expertise with the International Probiotics Association on the topic of development of standards for probiotic products. The ISAPP Executive Director, Mary Ellen Sanders, joined IPA representatives in Rockville MD at a meeting with the US Pharmacopeia on this topic. USP indicated that it was very open to developing product-specific third party confirmation of composition of probiotic products. In fact, its Dietary Supplement verification program is in full swing and USP is prepared to put resources behind development of this verification for probiotic products. However, this verification would be company-specific.
- ISAPP also convened a by-invitation, annual meeting in London Ontario Canada (see Appendices for report). In addition to discussion of emerging science in probiotics and prebiotics, this meeting featured an innovative discussion group which brought together members of the media and scientists to discuss how to improve science reporting and several regulatory representatives who benefited from interacting with the top-level scientists present at the meeting and also shared their perspectives on safety and efficacy of probiotics and prebiotic in government-funded research.
- In response to a report (Besselink, et al. 2008. Lancet 371(9613):651-9) of increased mortality in a study of administration of a blend of lactobacilli and bifidobacteria to hospitalized patients with acute pancreatitis, ISAPP prepared a press release and published a letter to the editor in the Lancet. One highlighted issue was that increased adverse events associated with use of live bacteria in acutely ill patients should not be interpreted to mean that the generally healthy population is at risk in consuming such live bacteria in food products with a long history of safe use.
- Guidelines were developed for consumers and healthcare professionals on probiotics and prebiotics (Appendices D and E)
- Articles summarizing key conclusions from the 2006 meeting in Coleraine Northern Ireland were published by Reid (2008) and Lenoir-Wijnkoop et al. (2007) (see below for full citations).
- The ISAPP Board of Directors held the following meetings:
 - October 27, 2008, by phone
 - November 9 and 11, 2008, London Ontario Canada

Board of Directors as of October 1, 2008

Note changes from 2007: Michael Cabana was added as new Member-At-Large; Todd Klaenhammer was moved to Program Chair and will move to Secretary October 1, 2009; Glenn Gibson agreed to continue as Vice President and will rotate to President October 1, 2009.

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ISAPP publications to-date

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Appendix A. 6th Annual Meeting of ISAPP

The International Scientific Association for Probiotics and Prebiotics (ISAPP) convened its 6th meeting November 9-11, 2009 at the Spencer Ivey Conference Center, London Ontario Canada. Hosted by Dr. Gregor Reid, this by-invitation meeting included 89 participants (30 scientists from our Industry Advisory Committee and 59 invited delegates, including students) from 17 countries. The program began with a plenary session with lectures on: the intestinal immune system and interactions with bacteria, delivered by Dirk Haller Ph.D. from the Technical University of Munich; safety of probiotics for use in healthy infants, delivered by Cathy Hammerman MD from the Department of Neonatology, Shaare Zedek Medical Center, Jerusalem, Israel; an update on the human microbiome project, by James Versalovic MD, Ph.D. and Michael Hsieh M.D., Ph.D., Texas Children's Hospital, Baylor College of Medicine; modulation of gut microbiota by prebiotics, by Nathalie Delzenne Ph.D. Université Catholique de Louvain; and probiotics and the media, by Gregor Reid Ph.D., University of Western Ontario, Canada. ISAPP was also fortunate to have participants from the US and Canadian regulatory agencies, who provided lectures followed by a round table discussion on regulatory hurdles on clinical research with probiotics in the USA.

The Late Breaking News session was crammed with tantalizing lectures on emerging issues in probiotics and prebiotics.

All day on day 2 of the meeting, break-out discussion groups were convened on the following topics:

- How do we know if a probiotic is safe for humans?
- How do we know if a prebiotic works?
- Where can probiotics or synbiotics make the biggest human health impact?
- Teaching, engaging and learning from the media.

A wrap-up session with reports from each group was held the next morning.

Meetings of the Board of Directors and the Industry Advisory Committee were also held during this conference. For the first time, the Industry Advisory Committee met separately from the ISAPP Board of Directors to discuss issues of importance to the general field of probiotics and prebiotics and to brainstorm opportunities for ISAPP to facilitate the science and communication of probiotics and prebiotics. This meeting was convened by Dr. Elaine Vaughan who serves as the industry representative to the ISAPP Board.

Appendix B. Reports on ISAPP-sponsored outreach meetings in 2008

India

ISAPP was fortunate to work together with the American Gastroenterology Association, Asia Pacific Disease Week, and the Indian Society of Gastroenterology on a symposium titled "Probiotics and Prebiotics in Gastrointestinal Health and Disease" September 13th, 2008, in Delhi, India. Francisco Guarner MD, a member of the AGA, was instrumental in establishing this collaboration. An audience of over 150 specialists was present to hear presentations from ISAPP President, Dr. Gregor Reid (Canada), and Drs. Francisco Guarner (Spain) Harsharn Gill

(Australia). Gratitude is expressed to industry sponsors Sanofi-Aventis and Danone for their contributions towards flight costs, distribution of information about the event and on-the-ground assistance in New Delhi. A full report can be accessed at <http://www.isapp.net/Indiamtgreport.pdf>.

Indonesia

ISAPP sponsored the International Symposium on Probiotic From Asian Traditional Fermented Foods For Healthy Gut Function. This meeting was organized by Dr. Ingrid Surono, Univeresity of Indonesia, Jakarta. The objectives of this meeting were to provide a forum for sharing research results among local and visiting professionals, and to encourage establishment of a probiotic research community in Asia. Close to 200 participants came together for this meeting. ISAPP sponsored travel to the meeting for Drs. Bruno Pot and Harsharn Gill, former ISAPP board members. A full report can be accessed at http://www.isapp.net/docs/Final_Report_indonesia_probiotics_Symposium-ISAPP.pdf.

Appendix C: Consumer Guidelines for Probiotics (can also be found on home page of www.isapp.net)



The P's and Q's of Probiotics: A Consumer Guide for Making Smart Choices Developed by the International Scientific Association for Probiotics and Prebiotics (www.ISAPP.net)

The concept of probiotics* has been around for over 100 years, but scientists are just starting to understand their role in maintaining health, regulating the immune system and managing disease. There are hundreds of probiotic products available and an overwhelming amount of information for consumers to sort through. The International Scientific Association for Probiotics and Prebiotics (ISAPP) has developed the following key criteria to help consumers find a credible probiotic product.

PROBIOTIC STRAIN: Not all probiotics are created equal

- *Different strains of even the same species can be different* – Probiotics within the same genus (or group), such as *Bifidobacterium*, do not necessarily provide the same benefits. A probiotic is defined by its genus (e.g. *Lactobacillus*), species (e.g. *rhamnosus*) and strain designation (often a combination of letters or numbers). The names sound complicated, but they are important to connecting the specific probiotic strain to the strain's published scientific literature.
- *Trademarked* – Often, product manufacturers will create a trademarked (™) or registered trademark (®) name for the strain found in their product for marketing purposes. It is just an "alias" for the probiotic strain and does not necessarily reflect product quality.

PROOF: Probiotics must be tested in humans and shown to have health benefits

- *"Clinically proven": Do your homework* – Make certain that product claims of health benefits are based on sound research done on the particular probiotic. The product should contain the specific strain(s) of bacteria at the same levels as used in published research. The studies should be performed in humans and published in peer-reviewed, reputable journals. Check product Web sites to see study results. Your pharmacist or healthcare provider should be able to help you sort through the scientific language.
- *Claims: What do they mean?* – Most probiotics are sold as dietary supplements or ingredients in foods, and cannot legally declare that it can cure, treat or prevent disease. Claims which relate the product to *health* are allowable. Any claim made on a product, no matter how general, is supposed to be truthful and substantiated – but not all manufacturers have this clinical substantiation.
- *Get your doctor's OK* – Consult a physician before administering probiotics to neonates or newborns or to people with compromised immune systems or other major underlying illnesses. Read "Warning" and "Other Information" on the product package and be aware of any expected symptoms or side effects. Probiotic foods should be safe for the generally healthy population to consume.
- *More information* – The product you choose should offer resources to find more information, including a Web site or consumer hotline.

QUALITY AND QUANTITY: Choose a quality product at the right quantity

- *What are CFU?* – CFU stands for colony forming units, which is the measure of viable microbes in a probiotic. CFU amount should be the same as that shown to be effective in clinical studies. More CFUs does not necessarily mean better quality.
- *What is the minimum CFU I should look for?* – The important thing to know is that different probiotics have been shown to be effective at different levels. It is not possible to provide one count for all "probiotics" – scientific literature has documented health benefits for products ranging from 50 million to more than 1 trillion CFU/day.

PACKAGE: Pick quality packaging and a trusted manufacturer

- *What can the label tell you?* According to the World Health Organization (WHO), probiotics packages should include the following information:
 - **Strain** – *What probiotic is inside?*
 - **CFU (Colony Forming Units)** – *How many live microorganisms are in each serving? When does it expire?*
 - **Suggested serving size** – *How much do I take?*
 - **Health benefits** – *What can this product do for me?*
 - **Proper storage conditions** – *Where do I keep it to ensure maximum survival of the probiotic?*
 - **Corporate contact information** – *Who makes this product? Where do I go for more information?*
- *Just because it says "probiotic," doesn't mean it is a probiotic* – Some products labeled "probiotic" do not have clinically validated strains or levels in the product. Although the scientific definition of probiotic stipulates that products be clinically evaluated, not all manufacturers abide by that.
- *Foods or supplements?* – Probiotics can be found in various foods, yogurts, and supplements. Probiotic content is generally more important than the way in which you consume them.
- *Live bacteria – through the end of shelf life* – Packaging should ensure an effective level of live bacteria through the "best by" or expiration date. Products should have an expiration date printed clearly on the package. Climate changes, exposure to oxygen and moisture can be important to keeping probiotics alive.
- *Obtain your probiotic from a trusted source* – A responsible manufacturer will make sure its probiotic product has the same strain(s) and is as potent through the end of shelf life as what was used in clinical studies.

*Probiotics are defined by the Food and Agriculture Organization of the United Nations as "live microorganisms, which when administered in adequate amounts confer a health benefit on the host." http://www.who.int/foodsafety/publications/fs_management/en/probiotics.pdf



Prebiotics: A Consumer Guide for Making Smart Choices

Developed by the International Scientific Association for Probiotics and Prebiotics (www.ISAPP.net)

Prebiotics are selectively fermented, dietary ingredients that result in specific changes in the composition and/or activity of the gastrointestinal microbiota, thus conferring benefit(s) upon host health. Unlike probiotics, a prebiotic targets the microbiota already present within the ecosystem, acting as a 'food' for the target microbes seen as beneficial. Prebiotics are currently being discussed by working parties of international scientific organizations such as the Food and Agriculture Organization of the WHO and the International Life Sciences Institute and changes to the definition and concept may follow in time. For now, their use as food ingredients or supplements is currently popular and gaining momentum. As such, the International Scientific Association for Probiotics and Prebiotics (ISAPP) has developed this information sheet to help guide consumers.

Why look for products with prebiotics?

Certain prebiotics, when used in adequate amounts, have been shown to provide health benefits including improved digestive function and intestinal environment, immunomodulatory benefits and improved absorption of dietary minerals. They can complement probiotic functions.

What makes a good prebiotic?

Currently 3 criteria are required for a prebiotic effect:

- Resistance of the prebiotic to degradation by stomach acid, mammalian enzymes or hydrolysis;
- Fermentation (breakdown, metabolism) of the prebiotic by intestinal microbes; and
- Selective stimulation of the growth and/or activity of positive microorganisms in the gut.

Obviously, safety of the ingredient is a must and good sensory properties desirable. Good prebiotics are stable under heat and when dried, and can be stored at room temperature for months. A daily dose of 5-8g/d fructooligosaccharides (FOS) or galactooligosaccharides (GOS) has a prebiotic effect in adults.

Which prebiotics are in the marketplace?

As the main reason for using a prebiotic is to provide benefits through gut bacteria, the most tested prebiotics are directed towards bifidobacteria and (to a lesser extent) lactobacilli. Future prebiotics may promote other beneficial gut organisms (for example, eubacteria, propionibacteria or roseburia). The most widely accepted prebiotics are FOS and GOS. To confirm prebiotic effects, well conducted human trials are required. These should be replicated in different labs. Consumers should look for the labels FOS, inulin (a type of FOS), GOS or TOS (*trans*GOS). There is a growing list of *candidate* prebiotics such as polydextrose, soybean oligosaccharides, isomalto-oligosaccharides, gluco-oligosaccharides, xylo-oligosaccharides, palatinose, gentio-oligosaccharides and sugar alcohols (such as lactitol, sorbitol and maltitol). However, the evidence for these, especially in humans, is not as well advanced as it is for FOS and GOS.

When is a "prebiotic" not a prebiotic?

- When it is degraded by stomach acid or human/animal processes in the gut.
- When it is fermented but not selectively so. To be selectively fermented, only a small number of beneficial bacteria should ferment the prebiotic – not a large number of microbes with ill-defined health effects.
- When it has only been tested in the lab, or in animals, and not in humans.
- When it is not adequately defined chemically and may contain impurities that are not important to its prebiotic properties.
- When it is not administered in sufficient amount to confer a measurable benefit.

Many food ingredients are being touted as prebiotics when in reality they are not.

Are prebiotics dietary fibre?

Both fibre and prebiotics are typically non-digestible carbohydrates, and both are typically fermented by gut bacteria. However, a prebiotic differs from fibre in that it needs to be *selectively* used in the gut – by only beneficial members of the gut microbial community. Historically, prebiotics are tied more closely to the probiotic concept than the fibre one. But some manufacturers refer to prebiotics as fibre, because the latter is more familiar to consumers.

What foods can I find them in?

Some prebiotics occur naturally in foods such as leek, asparagus, chicory, Jerusalem artichoke, garlic, artichoke, onion, wheat and oat, as well as soybean. However, it would take a large quantity of these foods for their active oligosaccharides to exert a useful prebiotic effect. A more realistic method involves fortifying popular foodstuffs with defined amounts of prebiotics. Thus, you will find that prebiotic compounds are added to many foods including yogurts, cereals, breads, biscuits, milk desserts, nutrition bars, ice-creams, spreads, drinks, water, infant formula, as well as to some animal foods.