

## WHAT WENT BY

### 25th Symposium on Intestinal Microbiota

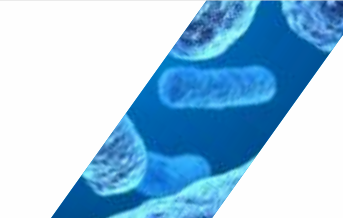
The 25th Symposium on Intestinal Microbiota and Mental Health was held in Tokyo, Japan on 4th November, 2016.

### 5th AFSLAB

The 5th AFSLAB was held in Taipei, Taiwan on 28th-30th November, 2016.

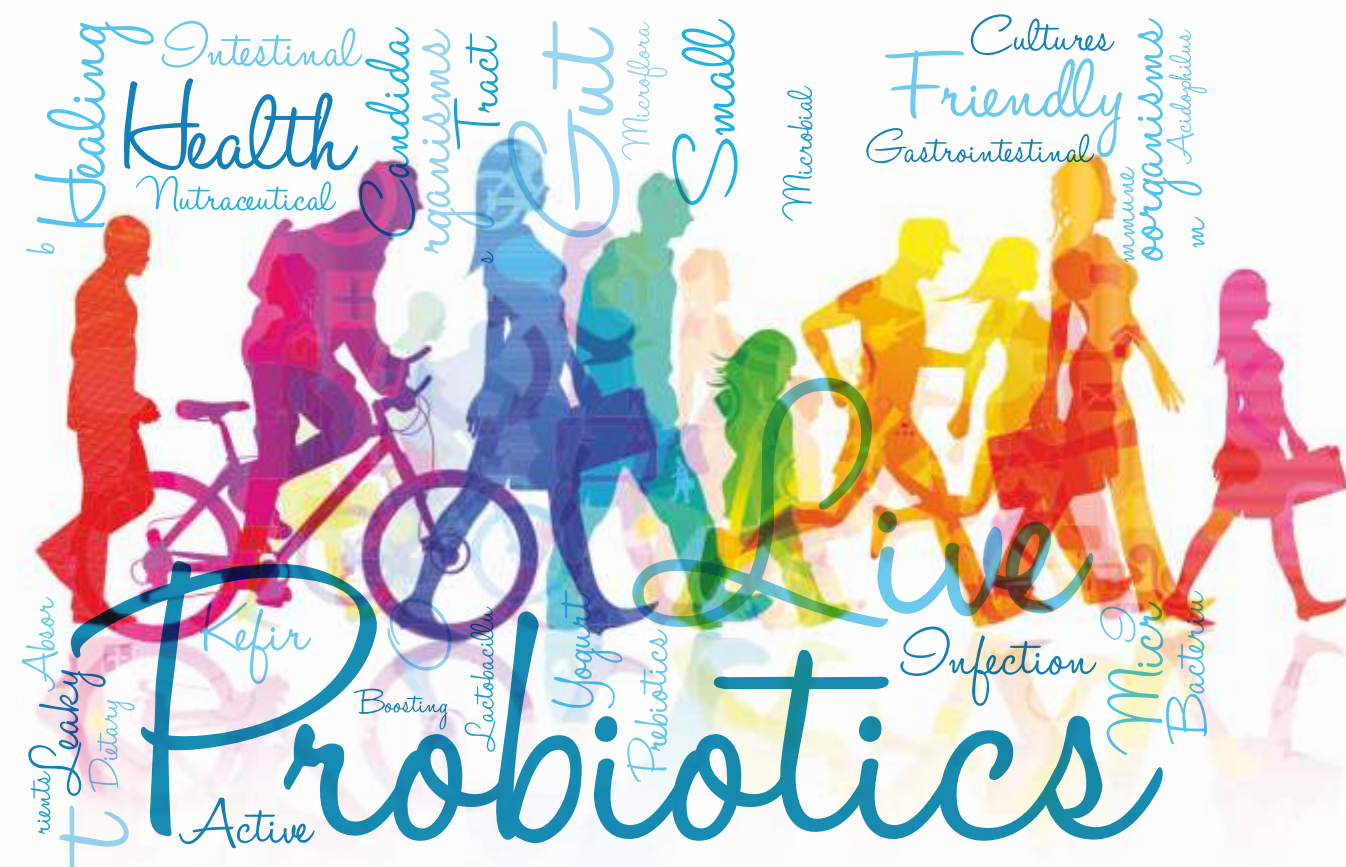
## WHAT WE HAVE NOW

<b>Nov 14-16, 2016</b> 17th World Congress on Oral Care & Probiotics Orlando, USA.	<b>March 1-2, 2017</b> The 2nd Probiotic Congress Asia, Hong Kong	<b>April 11-13, 2017</b> 3rd Annual Translational Microbiome Conference Boston, MA.	<b>May 19-20, 2017</b> 19th International Conference on Probiotic in Veterinary Medicine (ICPVM) Dubai, UAE.	<b>May 29-31, 2017</b> 11th World Congress on Nutrition & Food Science Osaka, Japan.	<b>June 27-29, 2017</b> ISAPP 2017 Annual Meeting Chicago, USA.
<b>June 19-22, 2017</b> The International Scientific Conference on Probiotics and Prebiotics - IPC2017 Budapest, Hungary	<b>July 27-28, 2017</b> 3rd International Conference on Nutraceuticals and Nutrition Supplements Rome, Italy	<b>August 27-31, 2017</b> 12th International Symposium on LAB Netherland, Europe	<b>Nov 9-10, 2017</b> 19th International Conference on LAB (ICLAB) San Francisco, USA.	<b>Nov 16-17, 2017</b> 19th International Conference on Nutrigenetics & Functional Foods San Antonio, USA	<b>Nov 20-21, 2017</b> 19th International Conference on Probiotic & Functional Foods (ICPFF) Paris, France.



# PROGUT III

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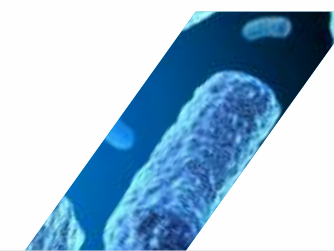
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GUT MICROBIOTA AND PROBIOTIC  
SCIENCE FOUNDATION (INDIA)







## MESSAGE FROM THE PRESIDENT

**Prof. N.K. Ganguly**

Professor of Eminence, Policy Centre for Biomedical Research, THSTI, Faridabad, India  
President, Gut Microbiota and Probiotic Science Foundation

Dear Colleagues,

It is with much excitement and anticipation that we release the third issue of the Foundation Newsletter! One year has gone by and there has been much progress.

The ongoing exploration of the human microbiome has shaken the very foundation of medicine and nutrition. The fascinating vision linking the Gut and the Brain, the understanding that maternal stress alters the vaginal microbiota, suggestions for vertical transmission of intestinal microbiota from mother to child, findings that differences in the vaginal microbiome can actually result in term or preterm birth, presence of microbiota in the lungs dubbed the “Lung Microbiome” has resulted in a paradigm shift in the way we think.

We are today plagued with questions and more questions. Can maternal stress during pregnancy affect postpartum development, does psychological stress affects our microbiota, can differences in microbiome profile be responsible for metabolic disorders like obesity and diabetes?

As the field of gut microbiome and probiotics moves to the next level, the transition of linking core species to identifying the core ecological functions has already begun. Scientists therefore continue to tinker with gut microbes and their metabolites to mitigate inflammatory disorders, heart diseases and liver disorder. Over the past 10 years, studies have linked the gut microbiome to a range of complex behaviours such as mood, emotion, appetite and safety.

The coming years promise to bring the link between gut and the brain into clearer focus. Recent studies have shown that the gut brain axis appears to be bidirectional and gut microbes help to control leakage through both the intestinal lining and the blood brain barrier which ordinarily protects the brain from potentially harmful agents. A proof of concept study uncovered the first evidence that probiotics ingested in food can alter human brain function. Certain probiotic strains were found to be more effective in treating anxiety and depression in laboratory mice suggesting that such findings may pave the path for the development of psychobiotics. Therefore, that leaves us with the question. “Can brain disorders like anxiety, depression and autism be treated through the gut?” which is a much easier target for drug delivery than the brain?

In the not too distant future each of us will be able to colonize our gut with smart bacteria that may help combat invading pathogens, diagnose early stages of cancer, correct diarrhoea and constipation, and regulate mood or behaviour. We are far from alone in our quest and scientists are working to design bacteria that secrete anti-inflammatory molecules and provide site specific drug delivery within the intestine.

The Gut Microbiota and Probiotic Science Foundation remain steadfast in its objective of bringing the latest science of Gut Microbiota and Probiotics to each one of you.

I really hope you enjoy what it has taken to put this newsletter together.

With best wishes,  
N.K. Ganguly



## MESSAGE FROM THE VICE PRESIDENT

**Dr. B. Sesikeran**

Former Director, National Institute of Nutrition, Hyderabad  
Vice-President, Gut Microbiota and Probiotic Science Foundation

Dear Colleagues,

The science of gut microbes and their role in modulating human health has been growing in an exponential manner. In recent years, we learnt that there is a vertical transmission of beneficial bacteria from mother to infant. This has been confirmed using targeted genome reconstruction. There are a few species of gut bacteria that are common to mother and child and remain so for another six months (Milani et al, Appl Env Microbiol, 2015). The gut microbe’s ability to communicate to the extent of even influencing human behavior was considered as a figment of imaginative science but several publications have now elucidated that pathway to be through the peptides secreted by the bacteria being able to communicate through the dendritic cells and the neuro-hormonal cells in the intestine. This would explain how they are modulating everything from immunity to behavior. With accumulating evidence, it is a matter of time before targeted probiotic therapies would be used to prevent and manage non-communicable diseases like diabetes, hypertension and heart disease.

The age-old dictum “The way to a man’s heart is through his stomach’ should be modified by replacing the word “stomach” with “colon.”

With best wishes,  
B. Sesikeran

### Did you know?

#### The White House launches the National Microbiome Initiative.

The White House has launched the National Microbiome Initiative (NMI) – an ambitious plan to better understand the microbes that live in humans, other animals, crops, soils, oceans, and more. Federal agencies have committed \$121 million to the NMI over the next two years while, more than 100 universities, non-profits, and companies have chipped another \$400 million.



## WHAT WE HAVE LEARNT LAST YEAR

### HIGHLIGHTS



Mouse experiments demonstrated that high-fat diet (HFD) administration altered gut microbiota composition and bile acid worked as a mediator to develop liver cancer and colitis.

**Prof. Atsushi Yokota**

(Professor and Vice Dean and University Senator, Hokkaido University, Hokkaido, Japan)



Host genetics play an important role in shaping the gut microbiota, but other factors, such as lifestyle, diet, medication and age can also exert a profound influence. Probiotics take part transiently in this ecosystem and may complement the functions of the resident microbiome.

**Dr. Muriel Derrien**

(Senior Research Scientist, Danone Research, Palaiseau, France).

Throughout life, the composition and function of the microbiota continues to be influenced by exposures including diet, medications, lifestyle and environmental stresses which in turn impact health and well-being of the host. This is being recognized as an important risk factor for the development of non-communicable diseases (NCDs) in today's society.

**Prof. Patricia Conway**

(Associate Professor, Microbiology, University of New South Wales, Australia).



A study was conducted to determine how undernutrition affects microbiome composition and function in 20 young children of various nutritional status in a rural district in West Bengal. The study showed that impaired nutritional status is not only due to the abundance of pathogenic microbial groups but also a result of depletion of several commensal genera.

**Prof. G. Balakrish Nair**

(National Chair, Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, India)



The excellent nutritional profile and health value of dairy products makes them an ideal carrier for delivery of probiotics. However, challenges for the probiotic dairy industry exist in India, an emerging market in Asia.

**Prof. A.K. Srivastava**

(Director and Vice- Chancellor, National Dairy Research Institute, Karnal, India).



Development of probiotics for local populations will depend on differences in composition of microbiota, specific nutritional and health requirements, survival in local food matrices, different probiotic functions and technological developments.

**Prof. Yuan Kun Lee**

(Head, Yong Loo Lin School of Medicine Life Science Curriculum, National University of Singapore, Singapore and President, International Union for Microbiology Societies (IUMS)).

Pregnancy includes unexplained microbiota changes that are associated with host physiological and immunological adaptations needed for a successful pregnancy. Transient changes lead to permanent alterations in immunological function causing increased susceptibility to atopic, immune-mediated, metabolic and potentially neoplastic diseases, as well as neuropsychiatric disorders.

**Prof. Bruno Pot** (Research Director, Center for Infection and Immunity of Lille (CIIL), INSERM, Institut Pasteur de Lille (IPL), France).



Probiotics impact mucosal immunity and have been used as adjuvants for mucosal as well as parentally administered vaccine. Lactobacillus are being used as a versatile delivery vehicle for developing new vaccine candidates for HIV, malaria and prevention of pneumococcal infections.

**Prof. N.K. Ganguly**

(Professor of Eminence, Policy Centre for Biomedical Research, THSTI, Faridabad, India).



Clinical trials have shown that *Lactobacillus casei* strain Shirota prevents gastrointestinal, upper respiratory tract infections and reduces the risk of bladder, colorectal and breast cancer.

**Dr. Masanobu Nanno**

(Executive Officer, Deputy Director of Institute, Yakult Central Institute, Tokyo, Japan).



In an effort to understand the effect of Indian indigenous probiotic strain, *Lactobacillus helveticus* MTCC 5463 was tested in Indian geriatric population where it showed benefit.

**Prof. J.B. Prajapati**

(Professor and Head, Dairy Microbiology Division, Anand Agricultural University, Anand, Gujarat, India).



## WHAT WE HAVE LEARNT LAST YEAR



Antibiotic-Associated Diarrhoea (AAD) poses a significant challenge during the management of infectious diseases. In the last decade, medical and non-medical professionals have suggested the use of probiotics as a means of preventing AAD.

**Dr. Ajay Bhalla**

(Additional Director & HOD - Gastroenterology, Fortis Hospital, Noida, India).

Probiotics may be useful in Inflammatory Bowel Disease (IBD) in both children and adults by effects related to enhancement of the host immune response and barrier function through interactions with epithelial and immune cells within both the small and large intestine and effects that arise due to activity in the colon due to inhibition of pathogen growth.

**Dr. Neelam Mohan** (Director, Department of Pediatric Gastroenterology, Hepatology and Transplantation, Medanta - The Medicity, Gurgaon, India).



Several meta-analyses have evaluated the effect of prophylactic probiotics on the prevention of neonatal necrotising enterocolitis and neonatal sepsis. They have all concluded that prophylactic probiotics reduce the incidence of severe necrotising enterocolitis and mortality in preterm neonates, but they do not have a beneficial effect on neonatal sepsis.

**Dr. Sourabh Dutta** (Additional Professor, Division of Neonatology, Department of Pediatrics, Post Graduate Institute of Medical Education & Research, Chandigarh, India).

## Young Scientists Forge Ahead

The 2015 Probiotic Symposium “Probiotics – From Bench to Community” witnessed 20 poster presentations by young scientists under the age of 40 years. The posters covered diverse areas of research that included structural and functional insights into the Indian gut microbiome, immune-modulatory and anti-carcinogenic role of probiotic strains. Exciting talks on the development of traditional fermented probiotic dairy products with indigenous probiotic strains and their utility for improvement of health outcomes were also presented. Three scientists were given the Young Investigator Awards.

1

**Pranav Pande**

(National Centre for Cell Science, Pune, Maharashtra )  
Indian gut microbiome: Subpopulation based structural and Functional Insights Using 16s rRNA Amplicon Sequencing



2

**Mangesh Suryavanshi**

(National Centre for Cell Science, Pune, Maharashtra)  
Perturbation in colonization and diversity of oxalate metabolising bacterial species (ombs) in recurrent oxalate stone disease



3

**Vamshi Saliganti**

(National Dairy Research Institute, Karnal, Haryana)  
Consumption of probiotic *Lactobacillus rhamnosus* MTCC 5897 fermented milk plays a key role on newborn's immune system development during suckling-weaning transition.



### Young Investigator Award – Prize money well spent !!!!

Pranav Pande, National Centre for Cell Science, Pune, Maharashtra who won the first prize for his poster presentation on “**Indian Gut Microbiome: Subpopulation based structural and functional insights using 16S rRNA amplicon sequencing**” utilized the prize money to attend the Human Microbiome Conference organized by European Microbiology Laboratory (EMBL), Heidelberg in Germany. Pranav was excited to learn from International experts like Prof. Martin Blaser, Prof. Rob Knight, Prof. Peter Turnbaugh, Prof. Julie Segre and many more.





## THE SCIENCE OF GUT MICROBIOTA - WHAT LIES AHEAD

### 1. **Rethinking Diet to Aid Human – Microbe Symbiosis** Derrien M et al; (2016); Trends in Microbiology; S0966-842X (16)30143-3

This review discusses the importance of diet as a factor contributing to host–microbe symbiosis, by driving the production of gut microbe-derived bioactive metabolites. It also reviews how the microbiota can be used to predict the response to dietary intervention and the need to select a new generation probiotics that can complement the functional deficiencies of the gut microbiota. It highlights the need to customize dietary recommendations according to the gut microbiota of the individual.

### 2. **Th17 Cell Induction by Adhesion of Microbes to Intestinal Epithelial Cells.** Atarashi K et al; (2015) Cell.; 163 (2); 367-80

In a joint research with Keio University School of Medicine, the mechanism of induction of Th17 cells involved in protection against infection and in the development of diseases such as inflammatory bowel disease and autoimmune disease was investigated, revealing that Th17 cells are induced by the strong attachment of Enterobacteria to the small intestinal epithelium. The study also identified 20 types of bacteria in human enterobacterial flora that induce Th17 cells. These results are expected to be useful in research to develop probiotics contributing to establishing diagnosis and treatment methods for autoimmune diseases such as inflammatory bowel disease that involve Th17 cells, and to controlling infections

### 3. **A Clinical Update on the Significance of the Gut Microbiota in Systemic Autoimmunity** Rosser EC et al; (2016) Journal of Autoimmunity 74 ;85-93

The gut microbiota plays a role in the development of a range of autoimmune diseases including inflammatory bowel disease, multiple sclerosis, type one diabetes and rheumatoid arthritis.

### 4. **Gut Microbiota and Allergic Disease in Children** Bridgman SL et al; (2016) Ann Allergy Asthma Immunol 116;99-105

Clinical trials have demonstrated that manipulation of the gut microbiota with prebiotics or probiotics might be effective in the primary prevention of atopic dermatitis.

### 5. **Going Beyond Bacteria - Can Fungal Signature be an Important Determining Factor of the Gut Microbiota of Pediatric IBD Patients** Chehoud C et al (2015) Inflamm Bowel Dis 21(8):1948-56

Patients with IBD had lower bacterial diversity and distinctive fungal communities. Two lineages annotating as Candida were significantly more abundant in patients with IBD whereas a lineage annotating as Cladosporium was more abundant in healthy subjects.

### 6. **Diversity in the Gut Bacterial Community of School Children in Asia?** Nakayama J et al (2015) Scientific Rep 5:8397

The microbiota profiled for 303 school children were classified into two enterotype like clusters each driven by Prevotella (P type) or Bifidobacterium / Bacteroides (BB type) respectively. Children from China, Japan and Taiwan harbored BB type, whereas those from Indonesia and Khon Kaen in Thailand harbored the P type which was characterized by a more conserved bacterial community.

### 7. **Ecological Robustness of the Gut Microbiota in Response to Ingestion of Transient Food-Borne Microbes.** Zhang C et al; (2016) ISME J.;0(9):2235-45

The study supports the concept that allochthonous bacteria have transient and subject-specific effects on the gut microbiome that can be leveraged to re-engineer the gut microbiome and improve dysbiosis-related diseases.

### 8. **Identification of an Intestinal Microbiota Signature Associated with Severity of Irritable Bowel Syndrome.** Tap J et al; (2016) pii: S0016-5085(16)35174-5

In analyzing fecal and mucosal microbiota from patients with IBS and healthy individuals, the authors have identified an intestinal microbiota profile that associates with the severity of IBS symptoms.

### 9. **Molecular Characterization and Meta-Analysis of Gut Microbial Communities Illustrate Enrichment of Prevotella and Megasphaera in Indian Subjects.** Bhute S et al; (2016) Front. Microbiol. 7:660

The present study describes gut microbial communities of healthy Indian subjects and compares it with the microbiota from other populations. Distinctive feature of Indian gut microbiota is the pre-dominance of genus Prevotella and Megasphaera.

### 10. **Are Microbes Central to Human Reproduction?** Reid G et al (2015) Am J Reprod Immunol 73:1-11

The presence of Lactobacilli in human follicular fluid suggests their association with infertility, embryo maturation and transfer. The presence of Lactobacilli reported in the ovaries is itself interesting and it has been proposed that the Lactobacilli could have ascended from the vagina and cervix along the fallopian tubes.



# 11. Are Bifidobacteria Being Sustainably Shared During Breastfeeding?

Makino H et al (2015) Benef Microbes 6(4):563-572

Genotyping of Bifidobacterial strains collected from 102 healthy mother- infant pairs from infants feces and human milk by multilocus sequence typing found that Bifidobacterial species belonging to *Bifidobacterium longum*, *Bifidobacterium breve* and *Bifidobacterium longum subsp. longum* could be identified as monophyletic between infants faeces and their mother's milk.

# 12. The Vaginal Microbiota, Human Papillomavirus Infection and Cervical Intraepithelial Neoplasia: What do we know and where are we going next?

Mitra et al; (2016) Microbiome;4:58

This review suggested that increased diversity of vaginal microbiota combined with reduced relative abundance of *Lactobacillus spp.* is involved in HPV acquisition and persistence and the development of cervical precancer and cancer.

## CONTINUE READING ....

### Fate, activity and impact of ingested bacteria within the human gut microbiota.

Derrien M and van Hylckama Vlieg JE (2015) Trends Microbiol 23(6):354-366

### Metabolism: Dietary emulsifiers – sweepers of the gut lining?

Canli PD (2015) Nat Rev Endocrinol 11:319-320

### Impact of demographics on human gut microbial diversity in a US Midwest population.

Chen J et al. (2016); PeerJ;4: e1514

### Diversity of Vaginal Lactic Acid Bacterial Microbiota in 15 Algerian Pregnant Women with and without Bacterial Vaginosis by using Culture Independent Method.

Alioua S et al; (2016) J Clin Diagn Res.; 23-27

### The vaginal and gastrointestinal microbiomes in gynecologic cancers: A review of applications in etiology, symptoms and treatment.

Chase D et al; (2015) Gynecol Oncol;138;190–200

## INTERESTING facts



90 % of the body's serotonin is made in the digestive tract by enterochromaffin cells. In a recently published paper in Cell it was found that EC cells from germ free mice produced approximately 60 % less serotonin than their conventional counterparts. When the germ free mice were recolonized with normal gut microbes, the serotonin levels went back up showing that the deficit in serotonin can be reversed. Hsiao and colleagues observed that the presence of a group of 20 spore forming bacteria elevated serotonin in germ free mice. The mice treated with this group also showed an increase in gastrointestinal motility compared to their conventional counterparts.

Researchers at Harvard Medical School and Columbia University have developed a new method to study the functions of hard to grow bacteria that contribute to the composition of the gut microbiome. More about the new method, TFUM sequence is published in the journal Molecular Systems Biology.

A university of Utah study published in Jan 2015 in Cell Host and Microbe demonstrates that mice deficient for a component of the immune system, MyD88 have an unbalanced microbial community and are more susceptible to IBD like illness.

Scientists have linked gastric bypass surgery which has reversed type 2 diabetes in obese individuals to an increase in the relative abundance of intestinal microbes such as Akkermansia muciniphila.

A combination of 17 strains of Clostridia bacteria enhanced the abundance of T regulatory cells.

Bacteria producing TMA (Trimethylamine) in the gut can influence inflammation linked cardiovascular diseases.

Lung like many human organs have their own bacterial inhabitants dubbed the "LUNG MICROBIOME" which is distinct from the intestinal microbiome.



## PROBIOTIC SCIENCE - EMERGING EVIDENCE



### 1. Probiotics: Definition, Scope and Mechanisms of Action

Reid G et al; (2016) Best Pract Res Clin Gastroenterol; 17-25

This review discusses the rationale for definition, scope of subject area and why alternatives have emerged.

### 2. Probiotics in Prevention of Necrotizing Enterocolitis: A Systematic Review and Meta-Analysis

Sawh SC et al; (2016) Peer J; 24-29

Thirteen Randomized trials (n = 5,033) including infants less than 37 weeks gestational age or less than 2,500 g on probiotic vs. standard therapy were analysed. The incidence of severe NEC and all-cause mortality was found to be reduced in the probiotic group. No difference was observed in culture-proven sepsis. Preterm infants benefit from probiotics to prevent severe NEC and death.

### 3. Probiotics Prevent Candida Colonization and Invasive Fungal Sepsis in Preterm Neonate: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

HU Hj et al; (2016) Pediatrics and Neonatology, 1-8

Seven trials involving 1371 preterm neonates were included in the meta-analysis. The results showed that probiotic supplementation was significantly associated with lower risk of Candida colonization. Limited data support that probiotic supplementation prevents invasive fungal sepsis in preterm neonates. High -quality and adequately powered RCTs are warranted.

### 4. Probiotics for the Prevention of Pediatric Antibiotic-Associated Diarrhoea

Goldenberg JZ et al; (2015) Cochrane Database of Systematic Reviews, Issue 12

Results from 23 trials that included 3938 participants for prevention of pediatric antibiotic-associated diarrhoea showed a precise benefit from probiotics compared to placebo. The incidence of AAD in the probiotic group was 8% (163/1992) compared to 19% (364/1906) in the control group.

### 5. Intestinal Microbiota Profiles of Healthy Pre-School and School-Age Children and Effects of Probiotic Supplementation

Wang C et al; (2015) Ann Nutr Metab; 67(4); 257-266.

In a joint research with the Juntendo University Graduate School of Medicine, it was demonstrated that consumption of a probiotic drink containing *L. casei* strain Shirota resulted in reduction of harmful microbes and opportunistic infectious agents that were present in the intestine of healthy children. The intestinal flora and intestinal environment was improved by the continued consumption of the probiotic.

### 6. Fermented Milk Consumption and Common Infections in Children Attending Day-Care Centers: A Randomized Trial

Prodeus A et al; (2016) J Pediatr Gastroenterol Nutr.; 63(5):534-543

Children aged 3 to 6 years received 100 g of a fermented milk product twice daily for 3 months, followed by a 1-month observation period. The primary outcome was the incidence of Common Infectious Diseases (CID's) during the product consumption period. There was a significantly lower incidence of CID rhinopharyngitis, in children consuming the fermented milk product compared with those consuming the control product (N = 81 vs N = 100, relative risk 0.82, 95% confidence interval 0.69-0.96, P = 0.017) when considering the entire study period.

### 7. A Summary of a Cochrane Review: Probiotics to Prevent Acute Upper Respiratory Tract Infections

Santesso N et al; (2015) Global Adv Health Med.; 4(6):18-19.

12 randomized controlled trials with 3720 participants including children, adults and older people that tested the effects of different types of probiotics on the development or duration of a URTI episode showed that the number of people who develop URTI is probably reduced when taking probiotics (odds ratio [OR]: 0.57, 95% confidence interval [CI]: 0.37-0.76.

### 8. Effectiveness of Probiotics in Irritable Bowel Syndrome: Updated Systematic Review with Meta-Analysis

Didari T et al; (2015) World J Gastroenterol; 21(10): 3072-3084

The review that included 1793 patients showed that probiotics reduce pain and symptom severity scores in IBS patients as compared to the placebo.

### 9. Probiotics as a Complementary therapeutic Approach in Nonalcoholic Fatty Liver Disease

Ferolla SM et al; (2015) World J Hepatol; 7(3): 559-565

Differences in gut microbiota between NAFLD patients and lean individuals as well as presence of small intestinal bacterial overgrowth (SIBO) in NAFLD subjects have been demonstrated. Some data indicate that the immunoregulatory effects of probiotics may be beneficial in NAFLD treatment as they modulate the intestinal microbiota; improve epithelial barrier function, strengthen intestinal wall decreasing its permeability; reduce bacterial translocation and endotoxemia; improve intestinal inflammation; and reduce oxidative and inflammatory liver damage.

### 10. Patients Receiving Prebiotics and Probiotics Before Liver Transplantation Develop Fewer Infections than Controls: A Systematic Review and Meta-Analysis

Sawas T et al; (2015) Clinical Gastroenterology and Hepatology; 13:1567-1574

4 controlled studies with 246 participants (123 received probiotics, 123 served as controls) showed that the infection rate was 7% in groups that received probiotics vs 35% in control groups (relative risk [RR], 0.21; 95% confidence interval [CI], 0.11-0.41; P<0.001).

### 11. Probiotics in Prevention and Treatment of Obesity.

Kobyliak et al; (2016) Nutrition & Metabolism; 13:14

Probiotics have physiologic functions that contribute to the health of gut microbiota, can affect food intake and appetite, body weight and composition and metabolic functions through gastrointestinal pathways and modulation of the gut bacterial community.

### 12. Consumption of Dairy Foods and Diabetes Incidence: A Dose-Response Meta-Analysis of Observational Studies.

Gijsbers L et al; Am J Clin Nutr. 2016 Apr; 103(4):1111-1124

The analysis included 22 cohort studies comprising 579,832 individuals and 43,118 T2D cases. Total dairy food consumption was inversely associated with T2D risk, with a suggestive but similar linear inverse association noted for low-fat dairy, but no added incremental benefits were found at a higher intake. Other dairy types were not associated with T2D risk.

### 13. Effectiveness of Lactobacillus Beverages in Controlling Infections Among the Residents of an Aged Care Facility: A Randomized Placebo-Controlled Double-Blind Trial.

Nagata S et al; (2016) Ann Nutr Metab; 68(1): 51-59

In joint research between Juntendo University Graduate School of Medicine and the Pediatric Department of Tokyo Women's Medical University Hospital, it was observed that consumption of a probiotic drink containing *Lactobacillus casei* strain Shirota in subjects including residents of care facilities for the elderly reduced the duration of fever and decreased the number of days for which diarrhoea or constipation was present. There was an improvement in both the composition of the intestinal flora and the intestinal environment which may reduce the risk of infection and improve quality of life in residents of care facilities for the elderly.



#### 14. Beneficial Effects of Citrus Juice Fermented with *Lactobacillus plantarum* YIT 0132 on Atopic Dermatitis: Results of Daily Intake by Adult Patients in Two Open Trials.

Mizusawa HN et al; Biosci Microbiota Food Health.(2016);35(1):29-39

A study of consumption of a fermented fruit juice drink containing *Lactobacillus plantarum* YIT 0132 in atopic dermatitis patients found improvements in atopic dermatitis symptoms and quality of life, and a decrease in blood markers (such as ECP and IgE) that are closely related to allergic disease. On the basis of the findings from this research, this fermented fruit juice drink is expected to be useful in regulating the immune balance of atopic dermatitis patients and relieving allergic symptoms.

#### 15. Dairy foods: Current Evidence of their Effects on Bone, Cardiometabolic, Cognitive, and Digestive health

Hess JM et al; (2016) Comprehensive Reviews in Food Science and Food Safety; 15(12): 251–268

This review concludes with a description of the current public health impact of dairy food research as well as the recommendation for the food industry to formulate dairy foods that are both palatable and health-promoting for consumers.

### CONTINUE READING ....

- **Probiotics – their potential role in allergy.**  
*Cuello-Garcia CA et al (2015) J Allergy Clin Immunol;952-961*
- **Respiratory tract infections in children - New evidence for the use of probiotics**  
*De Araujo GV et al (2015) J Pediatr (Rio J);413-427*
- **Can atopic diseases in children be prevented with Probiotics?**  
*Zuccotti G et al (2015) Allergy;1356-1371*
- **Health benefits of fermented milk containing *Bifidobacterium bifidum* YIT 10347 on gastric symptoms in adults.**  
*Gomi A et al (2015) J Dairy Sci 98:2277-2283*
- **Benefit of *Lactobacillus casei* strain Shirota on Constipation**  
*Sakai T et al (2015) Benef Microbes 6(3): 253-262*
- **Consumption of fermented milk containing *Bifidobacterium bifidum* on gastrointestinal disorders**  
*Urita T et al (2015) Bioscience of Microbiota, Food and Health 34(24):37-44.*
- **Glycemic Control: Is there a role for Probiotics?**  
*Ruan Y et al (2015) PLoS One 10(7); 0132121*
- **Decreased plasma myeloperoxidase associated with probiotic therapy in autistic children.**  
*Russo AJ et al (2015) Clin Med Insights Pediatr 9:13-7*
- **Novel Probiotics and Prebiotics – Road to the Market.**  
*Kumar H et al (2015) Current Opinion in Biotechnology 32:99 - 103*

### HOW DO PROBIOTICS WORK IN ERADICATION OF *H pylori*?

Studies suggest that probiotics may inhibit acute membrane leakage induced by *H pylori*, may also hinder adherence of *H pylori* to mammalian gastric mucosa and suppress *H pylori* related IL-8 production in gastric cell line and within gastric mucosa.

## GLOBAL RECOMMENDATIONS FOR PROBIOTICS

### World Gastroenterology Organisation (WGO) Global Guidelines

The World Gastroenterology Organization Global Guidelines on Probiotics and Prebiotics have very well explained the concept that underlies their utility and the different clinical conditions for which there is evidence from at least one well designed and properly powered clinical trial that oral administration of a specific probiotic strain or a prebiotic is effective and beneficial for a healthy or therapeutic outcome.

**Guarner F et al (2012) World Gastroenterology Organisation Global Guidelines: Probiotics and Prebiotics October 2011. J Clin Gastroenterol 46(6):468-81.**

### World Allergy Organization (WAO)

World Allergy Organization (WAO) guideline panel determined that there is a likely net benefit from using probiotics resulting primarily from prevention of eczema.

The WAO guideline panel suggests:

- a) using probiotics in pregnant women at high risk for having an allergic child
- b) using probiotics in women who breast feed infants at high risk of developing allergy and
- c) using probiotics in infants at high risk of developing allergy

**Conclusions:** WAO recommendations about probiotic supplementation for prevention of allergy are intended to support parents, clinicians and other health care professionals in their decisions whether to use probiotics in pregnancy and during breast feeding, and whether to give them to infants.

**Fiocchi A et al (2015) World Allergy Organization Journal 8:4.**

### International Scientific Association for Probiotics and Prebiotics (ISAPP)

Consensus Panel Recommendations for the Scope of Probiotics–

- a) Retain the FAO/WHO definition for Probiotics, with a minor grammatical correction as "live microorganism that, when administered in adequate amounts, confer a health benefit on the host"; inconsistencies between the Expert Consultation and the FAO/WHO Guidelines were clarified.
- b) Include in the framework for definition of Probiotics microbial species that have been shown in properly controlled studies to confer benefits to health.
- c) Any specific claim beyond "contains probiotics" must be further substantiated.
- d) Keep live cultures, traditionally associated with fermented foods and for which there is no evidence of a health benefit, outside the probiotic framework.
- e) Keep undefined, fecal microbiota transplants outside the probiotic framework.
- f) New commensals and consortia comprising defined strains from human samples, with adequate evidence of safety and efficacy, are 'probiotics.'

**Hill C et al (2014) Nature Reviews Gastroenterology & Hepatology 11:506–514**

### European Society for Paediatric Gastroenterology, Hepatology & Nutrition (ESPGHAN)

Probiotics may be an effective adjunct to the management of diarrhoea. However, because there is no evidence of efficacy for many preparations, we suggest the use of probiotic strains with proven efficacy and in appropriate doses for the management of children with Acute Gastroenteritis (AGE) as an adjunct to rehydration therapy.

The following probiotics showed benefit in meta-analyses of RCTs: *Lactobacillus GG* and *Saccharomyces boulardii*.

Evidence of lack of risk of antibiotic resistance transfer is required for probiotics proposed for clinical use.

**Guarino A et al (2008) J Pediatr Gastroenterol Nutr 46(5):619-621.**