VIRTUAL EVENT

19-20
JUNE 2023

2ND EDITION OF
INTERNATIONAL CONFERENCE ON

PROBIOTICS AND PREBIOTICS

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BOOK OF ABSTRACTS

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19-20 JUNE

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Welcome Message

The interest in probiotics has increased largely due to the compelling evidence of their beneficial effects on health not only in humans but also in plants and in farm animals. The use of probiotics increased largely during the COVID-19 pandemics. In addition, probiotics are an excellent alternative to the use of antibiotics against bacteria and parasites but there is still lots to investigate. Notably, probiotic benefits may go beyond defensive or digestive functions. For example, plant derived probiotics might help women fight osteoporosis. Seemingly there may be multiple uses of probiotics in addition to those known now. Outstanding strains may be selected from the enormous bacterial diversity that exists in nature in healthy animals and plants. We are learning more and more on how and when to use probiotics. Synergisms of combined strains or multispecies probiotics are promising to enhance beneficial effects.

I want to transmit to you my excitement to listen all the new advances that will be presented in this congress. Welcome to the PROBIOTICS 2023 Congress!

Martinez Romero
National Autonomous University of Mexico, Mexico

Welcome Message

Dear conference attendees, keynote speakers, and participants, it is an honor and pleasure to welcome you all. Microbiology has been an exciting subject, especially in advanced fundamental and applied research. This subject has played a significant role in improving human lifestyle and health. One of the recent advanced research approaches that have been encouraged to improve human health is 'Probiotics.' Prebiotics and symbiotics are under the same umbrella of probiotics. Several scientific shreds of evidence have proved the beneficial effects of probiotic organisms. Different functional properties and mechanisms of probiotic organisms improve the gut environment, which is directly related to the health of the host. Recent studies have revealed the brain and gut microbiome axis, which interprets the gut microbiome's influence on brain functionalities; this approach has led to the development of the term 'Psychobiotics.' Geographical location impacts microbial populations due to prominent differences in diet across geographic regions. Hence, the formulation, technological and economic conditions of probiotics differ accordingly. However, for the application of probiotic formulations, other aspects, such as an optimized delivery system and appropriate packaging, preserving the required properties of the probiotic formulations throughout their shelf life. The encouraged use of probiotics, especially in the COVID-19 era, for improving the immune system has led to the rising market potential of probiotics in India and worldwide.

Prof. Ramesh Kothari
Saurashtra University, Rajkot, Gujarat, India

Welcome Message

Dear participants, it is my honor to write a welcome note. Nutrition; It includes the adequate, balanced and healthy intake of the nutrients it needs depending on the productivity level, gender, species and age of the living thing. Adequate and balanced consumption of nutrients is effective in growth, maintenance of life, protection of health and increasing quality of life. As it is known, after the understanding of the disadvantages of antibiotics on human and animal health, the use of antibiotics as growth factors in animal feeds was prohibited. The gap created as a result of legal regulations regarding antibiotics has brought alternative feed additives such as probiotics to the agenda. Probiotics are biological products that contain live cultures of bacteria or yeast. Probiotics are added to food or water in different forms (powder, granule, liquid suspension, capsule and pellet) for purposes such as regulating gastrointestinal flora and fauna, preventing the development of pathogenic microorganisms and increasing feed efficiency.

Prof. Dr. Nurinisa Esenbuga
Erzurum, Turkiye

Welcome Message

Dear participants, it is a pride for me to be together with the stakeholders of the probiotics and prebiotics sector. I wish this conference opens the doors of new ideas. Effective use of probiotics and prebiotics are important for both nutrition and protection from diseases. It will also ensure that they are produced at lower costs and to be used more widespread. In this way, it will increase profitability in food and pharmaceutical industry. Consumers will be able to purchase products containing high number of live probiotics at reasonable prices. For these reasons, new studies are needed in the field of probiotics. The PROBIOTICS 2023 conference will be an efficient platform where scientific shares that can meet the sector needs and consumer expectations. I wish the congress to have successful results and offer my respects to all participants.

Dr. Yasin ozdemir
Yalova, Turkiye

Keynote Speakers

Dipak P Ramji
Cardiff University, United Kingdom

Esperanza Martinez Romero
National Autonomous University of Mexico, Mexico

Ramesh Kothari
Saurashtra University, India

Nurinisa Esenbuga
Ataturk University, Turkey

Yasin Ozdemir
Ataturk Horticultural Central Research Institute, Turkey

Thank You All...

ABOUT
MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus Group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conferences and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

ABOUT
Probiotics 2023

We are excited to announce the upcoming 2nd Edition of the International Conference on Probiotics and Prebiotics (Probiotics 2023), organized by Magnus Group. This highly anticipated event will be held as an Online Event from June 19-20, 2023. Following the success of previous editions, our aim is to continue fostering knowledge exchange and collaboration in the field of Probiotics and Prebiotics. Under the theme "Deciphering the Scientific Landscape on Probiotics and Prebiotics," this conference offers a unique opportunity for academicians, researchers, scientists, and industry representatives to come together and share their valuable insights, groundbreaking research, and innovative ideas. The event will serve as a global platform, facilitating discussions on practical challenges, concerns, and potential solutions. Probiotic and Prebiotic research is undergoing a remarkable transformation. Food technologists are paving the way for new avenues of investigation, leading to the development of Probiotic food formulations. As we embark on this journey, it becomes increasingly important to expand our knowledge and conduct further research in probiotics, fermentation processes, and medical discoveries. Probiotics 2023 presents an exceptional opportunity to enhance our understanding, generate fresh ideas, and contribute to the advancement and evolution of cooperative academic research. The scientific program will focus on the latest international advancements in Probiotic science, with a particular emphasis on multidisciplinary research spanning both basic and applied domains. This conference offers an excellent networking opportunity, fostering lifelong friendships among fellow participants and partners. We hope that Probiotics 2023 will be an exceptional conference experience for you, where you will return home with revitalized scientific ideas and connections with international colleagues.

BOOK OF ABSTRACTS

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19-20 JUNE

DAY 01

KEYNOTE FORUM

2ND EDITION OF

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PROBIOTICS AND PREBIOTICS

Gut microbiota: An integral part of sustaining human health

The human body consists of a complex ecosystem collectively known as microbiota; diverse microbiota lives in mutual harmony and inhabits different areas of the human body- especially gut microbiota, which lives with us in a mutually beneficial life-long relationship. Gut microbiota plays a crucial and constructive role in maintaining and improving the host's health through various metabolic activities. The importance of gut microbiota in maintaining the host's health has been proved by fascinating scientific shreds of evidence of benefits on human health. These benefits can be enhanced by consuming friendly (probiotic) microorganisms and food (prebiotics) to improve the gut microbiome. Among them, probiotics have emerged as evolving and encouraging paths to improve human health by enhancing the immune system of the host by maintaining microbial balance in gut microbiota. Hence, probiotic organisms have been explored extensively to study their beneficial effects on controlling various diseases. Strong scientific evidence is associating these bacteria with the prevention and therapy of various GI disorders such as inflammatory bowel diseases, Irritable Bowel Syndrome (IBS), lactose intolerance, etc. The thorough study of probiotics has led to the formation of various food supplements and functional foods to provide their beneficiaries to consumers. Recent studies have pointed out the link between the gut microbiota and the nervous system, including the brain, which can support the treatment of mental health issues such as anxiety, depression, and neurological conditions. This study has led to the concept of psychobiotics, however, the application is in the primary stage. In light of the ongoing probiotics trend, further research is needed to obtain the perspectives of potential applications for better health.

Keywords: Gut microbiota, Probiotics, Prebiotics, Human Health, Psychobiotics.

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[2]Department of Biology, Shri M & N Virani Science College, Saurashtra University, Rajkot, Gujarat, India

Biography

Ramesh Kothari post-graduated in microbiology at the Saurashtra University, Rajkot, Gujarat, India. He received his Ph.D. degree in 2002 at the same institution. After his postdoctoral research from the University of Medicine and Dentistry of New Jersey (UMDNJ- now Rutgers University) Newark, USA, he joined as a Direct Professor in Microbiology at the Department of Biosciences, Saurashtra University, Rajkot, India. He has 22 years of research and teaching experience. He has published 47 research publications and more than 12 research papers in conference proceedings. He has guided 13 Ph.D., 08 M.Phil. and more than 50 M.Sc. Dissertation research students.

Impacts of humate and probiotic supplementation on performance, egg quality and blood parameters of layer hens under different cage densities

The aim of this study is to determine the effects of humate and probiotics added to the diets of laying hens housed in different cage densities on performance, egg quality and blood parameters. In the study, laying hens were kept in two cage densities as 4 and 6 (540 ve 360 cm2/hen) chickens in cages. Experimental groups were fed with control (basal feed), basal feed + 0.15% humate and basal feed + 0.15% probiotic added diet. At the end of the research, as the cage density increased and the cage area per animal decreased, feed consumption, egg weight and feed conversion rates decreased ($p<0.01$). This situation, which is caused by the cage density, was somewhat improved with the addition of humate and probiotics to the diet ($p<0.01$). The effect of cage density and additives on egg quality characteristics was insignificant except for albumin index and Haugh unit. Blood serum parameters such as glucose, creatine, total protein, albumin, globulin and corticosterone levels increased significantly with the increase in cage density ($p<0.05$ and $p<0.01$). Humate and probiotic supplements added to the diet had an insignificant effect on triglycerides, cholesterol VLDL and corticosterone, but significantly affected other blood parameters. As a result, it was observed that humate and probiotic supplementation partially alleviated the negative effects of stress caused by increased cage density by improving the laying performance and metabolic profile.

Keywords: Laying hen, cage density, humate, Probiotic performance, egg quality, blood parameters

Nurinisa Esenbuga*, Muhlis Macit

Department of Animal Sciences, Faculty of Agriculture, Erzurum, Turkey

Biography

Prof. Dr. Nurinisa Esenbuga is a Professor at the Department of Animal Science of Ataturk University in Turkey. She has M.Sc. (1995) and Ph.D. (2000) degrees from the Department of Animal Science. Since 1992 she has continued her research and teaching activities. She is the author of more than 106 scientific papers. She had studied at the Department of Animal Science of Ohio State University as post-doctorate. She has contributed different project and had some grants from National Institutions. Prof. Dr. Esenbuga has gained major experience in project development; implementation and management by means of the various roles. She has undertaken in several national (e.g. TÜBİTAK, KUDAKA and BAP) research projects throughout her research career.

Probiotics in the prevention and treatment of atherosclerosis and cardiovascular disease

Atherosclerosis, an inflammatory disorder of the vasculature and the underlying cause of myocardial infarction and cerebrovascular accidents, is responsible for more global deaths than any other disease. Although reduction in morbidity and mortality from atherosclerosis and its complications has been achieved recently by lifestyle changes and pharmaceutical intervention, this is expected to reverse in the future because of global increase in risk factors such as hypercholesterolemia, obesity, and diabetes. Current pharmaceutical therapies against atherosclerosis are associated with substantial residual risk for cardiovascular disease together with other issues such as side effects. In addition, pharmaceutical agents against many promising targets have proved disappointing at the clinical level. It is therefore essential that the molecular basis of atherosclerosis is fully understood, and new therapeutic/preventative agents or targets are identified and validated. The major focus of recent research in my laboratory is to understand the molecular mechanisms underlying the protective anti-atherogenic actions of natural products using a combination of in vitro and in vivo model systems together with biochemical, molecular biology and immunological approaches. Our research has provided novel insights into the mechanisms underlying the protective actions of several nutraceuticals. This presentation will discuss the molecular basis of atherosclerosis, current therapies against the disease and their limitations, emerging therapies targeting lipid metabolism and the inflammatory response, and the potential of probiotic bacteria as preventative and therapeutic agents.

Audience Take Away Notes

- The audience will learn about how probiotics can prevent and treat cardiovascular disease.
- The research-led knowledge base will positively impact their jobs.
- The research could be used other faculty to expand their research or teaching.
- The research could impact therapeutic options available in cardiovascular disease.
- The research could lead to development of new agents to prevent and treat heart disease.

Dipak P Ramji

Cardiff School of Biosciences, Cardiff University, Cardiff, United Kingdom

Biography

Dipak Ramji is Professor of Cardiovascular Science and Deputy Head at the School of Biosciences in Cardiff University. He is also fellow of the Learned Society of Wales. He received his BSc (Hons) degree (Biochemistry) and his PhD (Molecular Biology) from the University of Leeds. This was followed by post-doctoral research at EMBL (Heidelberg) and IRBM (Rome) with fellowships from the Royal Society and the EU. His current research is focused on understanding how natural products regulate cellular processes in heart disease with the goal of attaining deeper mechanistic insight and identifying preventative/therapeutic agents. He has published over 150 research articles (h index 42 and i10 index 78 with over 8670 citations), including 880 page book in 2022 on Methods in Atherosclerosis. He is an Editorial Board member of 16 international journals; regular organising committee member, speaker, and track/session chair at international conferences on heart disease; involved in grant evaluation for over 20 organisations; and supervised over 25 PhD students.

Probiotics from plants

Plant bacteria are a valuable source of probiotics. However human pathogens or opportunistic pathogens may be found in healthy plants and some may be recalcitrant to eliminate, especially when they are inside plant tissues, as endophytes, not easily eliminated with surface disinfection procedures. Endophytes are commonly consumed by animals when eating raw vegetables. Plant-beneficial endophytes may be selected in seeds, as they are transmitted to new plant generations determining their health. Among endophytes, we commonly found Klebsiella variicola.

Objectives:

i) Test seed endophytes from Phaseolus vulgaris in vitro for their capacity to inhibit plant pathogenic fungi.

ii) Analyze the genomes of Klebsiella isolated from animals to try to understand their origins and roles in hosts.

Methods: We identified from seeds of Phaseolus vulgaris (common bean) diverse Bacillus strains and supposed that could help defend plantlets from fungal pathogens. A suspension of fungal spores was inoculated on one side of PY plates and a spot of Bacillus cells on the opposite side. After 1 week at 30°C, inhibition halos were measured. Nitrogen-fixing K. variicola has been proposed to be used as a plant growth promoter and even as a probiotic in baby formulas. We searched this bacterium in association with healthy animals such as the Gopherus berlandieri tortoise, Ross chicken and the larvae of the Comadia redtenbacher moth. Genomes of nitrogen-fixing Klebsiella strains were sequenced and analyzed.

Results and discussion: Antagonism experiments showed that Bacillus endophyticus and Bacillus velezensis decreased, up to 60%, the growth of Botryosphaeria dothidea and Fusarium oxysporum pathogenic fungi. The causal agent of anthracnose, Colletotrichum gloeosporioides, was inhibited up to 50% by Bacillus pumilus and B. velezensis. Klebsiella isolates were found in tortoise and chicken feces and in moth larvae. Klebsiella genomes from plants and larva isolates had the basic virulence factor (fimbriae and siderophores) and intrinsic ampicillin resistance genes. We are analyzing the genomes from klebsiellas isolated from chicken feces to try to understand their origin and role in these hosts. Besides being an endophyte, Klebsiella has been found in patients in the clinics and more recently it has been found associated with long COVID 19 patients, thus Klebsiella use should be taken with caution.

Conclusions: Our results support the use of B. endophyticus, B. pumilus, and B.velezensis as effective antifungals and may be considered as plant probiotics. We found that plant and larva associated K. variicola strains have basic virulence genes or antibiotic resistance genes and maybe

Maria del Carmen Alcala[1], Jose Luis Aguirre Noyola[1], Marco A. Rogel[1], Maria Fernanda Garcia[1], Diana Hernandez-Oaxaca[1], Ulises Garza-Ramos[2], Monica Rosenblueth[1], Julio Martinez Romero[1], Esperanza Martinez-Romero[1]*

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[2]National Institute of Public Health, Cuernavaca, Morelos, Mexico

Biography

Professor Esperanza Martínez-Romero is a professor and head of the Genomic Ecology Program at the Genomic Sciences Center at UNAM. She studies the mutualistic symbioses of bacteria with plants and animals native to Mexico using metagenomic and functional genomics approaches. She was a pioneer in the molecular study of the nitrogen-fixing symbioses of beans and endophytes of corn and beans. She has given workshops and advice to agricultural producers. She described new species of bacteria from plants and insects from Mexico, some of them nitrogen-fixing bacteria. The strains that she obtained have been deposited in official bacterial collections and

they are safe to be used in inoculation assays. In animals, we suppose that the mother to progeny transfer of Klebsiella would ensure that nonpathogenic strains are transmitted. Our genomic results indicate that K. variicola strains vary in gene content and may be adapted to distinct hosts.

Audience Take Away Notes

- The Audience May Search for beneficial bacteria in plants.
- This will enlarde this view of probiotics.
- It will enlarge their teaching and research approaches.
- Yes, considering that there may be pathogens among plant bacteria is essential in designing strategies of use of plant bacteria.

some of them are used as inoculants or biofertilizers in agriculture. She has received awards and prizes such as the National University Award, the Mexican Academy of Sciences Award and recently, the National Science Award of Mexico in December of 2019 and the UNESCO Prize for Women in Science in March 2020. She has been recognized as a highly cited Mexican scientist. She has published 216 articles in international journals, 23 book chapters and 11 genome announcements. She has received more than 20,400 citations to her published work, with an H-index of 80.

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DAY 01

SPEAKERS

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Xiaoxi Fu[1]*, Amy Lovell[1], Barbara Galland[2], Robyn Lawrence[1], Nisha Mahawar[1], Nicole Roy[3], Warren McNabb[4], Jacqueline Tonkie[4], Jane Mullaney[5], Karl Fraser[5], Wayne Young[5], Janine Cooney[6], Yannan Jing[7], Clare Wall[1]

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[5]AgResearch Ltd Grasslands Research Centre, Palmerston North, New Zealand
[6]The New Zealand Institute for Plant and Food Research Ltd, Palmerston North, New Zealand
[7]Faculty of Science, Statistics, the University of Auckland, Auckland, New Zealand

The effect of prebiotic food on sleep patterns during complementary feeding – A study protocol

Sleep plays a critical role in promoting healthy brain development, including cognitive function, memory, and language development. Sleep deprivation and related issues have been associated with obesity and behavioural problems later in life. One of the most commonly reported infant sleep-related issues by parents is frequent night waking, with many parents believing hunger to be one of the main causes of their infants waking up at night. Prebiotic foods are a potential solution for hunger-induced night waking. Prebiotic foods contain complex carbohydrates such as resistant starches that are not digested in the upper digestive tract but are fermented by the gut microbiota in the colon, resulting in the production of Short-Chain Fatty Acids (SCFAs). Propionate, one of the SCFAs produced, is a primary substrate for gluconeogenesis in the liver - a metabolic pathway that allows the body to generate glucose from non-carbohydrate sources such as amino acids and fatty acids. The increased production of SCFAs and subsequent conversion to glucose in the liver may enhance satiety, thereby keeping infants fuller for longer periods, leading to longer uninterrupted sleep periods and fewer night wakings. A double-blinded Randomised Controlled Trial (RCT) has been designed to determine the effects of a prebiotic food: a New Zealand-grown sweet potato locally known as kūmara, with or without the added effect of green banana resistant starch, on the development of the infant immune system. As a secondary objective, sleep data were collected to explore the relationship between prebiotic feeding and infant sleep patterns. The study aims to recruit three hundred infants around six months of age, prior to starting solids, from Auckland, New Zealand. The study design consists of three parallel arms, including two intervention groups: standard kumara (K) and kumara with added green banana resistant starch (K+), as well as a control group (complementary feeding as per New Zealand National Dietary Guidelines). Infant stool samples and sleep data were collected at three time points: when the infants were 6 months old (baseline), 8 months old and 10 months old. To obtain a true reflection of infant sleep patterns, both subjective assessment tools (a parent-completed sleep diary and Brief Infant Sleep Questionnaire) and an objective assessment tool (5-day actigraphy) were used. Infant stool samples were analysed to assess gut microbiota diversity and Short-Chain Fatty Acid content. This study is the first large-scale Randomised Control Trial to investigate the causal relationship between prebiotic feeding and infant sleep, providing a possible explanation of the mechanism behind the changes through the alteration in short-chain fatty acids and microbial diversity.

Audience Take Away Notes

- The feasibility of conducting a feeding trial in infants.
- Sleep assessment tools that could be used to capture a true reflection of infants' sleep patterns will be described. Novel ways to subjectively and objectively measure infant sleep through the use of sleep records and questionnaires, and the use of actigraphs attached to the calf with Neoprene bands.
- Building on previous research (Heath et al. 2020) to gain insights into the relationship between microbial metabolites (Short Chain Fatty Acid Production) and infant sleep patterns.

Biography

Xiaoxi Fu completed a Bachelor of Science in Human Nutrition in 2016 and went on to complete a postgraduate diploma with a research focus on infant feeding methods. She worked as a research assistant at the National University Hospital in Singapore before beginning her PhD in Health Sciences at The University of Auckland's Faculty of Medical and Health Science in 2019. Xiaoxi's research focuses on the effects of introducing a prebiotic-rich food as the first food on infant sleep patterns in the first year of life, as part of The Seeding through Feeding (SUN) Study under the supervision of Prof. Clare Wall.

Natalia Baryshnikova [1,2,3]*, Anastasia Ilina[3], Yury Uspenskiy [1,2], Alexander Suvorov[3] and Elena Ermolenko[3]

[1]St-Petersburg State Pediatric Medical University, St-Petersburg, Russia
[2]Pavlov First St-Petersburg State Medical University, St-Petersburg, Russia
[3]Institute of experimental medicine, St-Petersburg, Russia

Auto probiotics as an alternative way to eradicate *Helicobacter pylori* infection

Aim: Evaluation of the clinical efficacy of auto probiotic (indigenous enterococci) monotherapy in H. pylori eradication.

Materials and methods: 95 patients with H. pylori-associated dyspepsia underwent examination: assessment of symptoms of dyspepsia before and after treatment, endoscopic examination of the upper gastrointestinal tract with biopsy to verify H. pylori infection (biochemical, bacteriological, molecular genetic examination of biopsies). Antagonistic activity against H. pylori in vitro for an autoprobiotic based on indigenous Enterococcus faecium was determined by the drip method. To study the antagonistic activity in vivo, an autoprobiotic with indigenous Enterococcus faecium was used, which was prescribed per os twice a day for 50 ml (8,0 LGU/ml) for 20 days. Eradication control was made using the determination of the antigen of the microorganism in the feces 1.5-2 months after the end of treatment.

Results: Initially, H. pylori infection was confirmed in 49.4% of patients. In vitro, the sensitivity of the microorganism to indigenous enterococci was detected in 81% of the strains.

12 patients received autoprobiotic as monotherapy. This group included patients with a history of allergic reactions to antibiotics used in standard eradication therapy regimens. When using an autoprobiotic, the eradication rate was 80%. Relief of symptoms of dyspepsia (belching, heartburn, epigastric pain, nausea, flatulence) was noted in all patients.

Conclusion: The sensitivity of the studied H. pylori strains to an autoprobiotic is comparable to the sensitivity of the microorganism to antibiotics often used in eradication schemes. Monotherapy with an autoprobiotic with indigenous enterococci showed a high percentage of elimination of the pathogen. If it is impossible to use standard anti-helicobacter therapy, the appointment of autoprobiotics is a reasonable alternative treatment option. However, further research is needed to expand the evidence base for evaluating the effectiveness of enterococcal- based drugs in H. pylori eradication.

Biography

Dr. Natalia Baryshnikova studied Medicine at the St. Petersburg State Medical Academy Named after I. I. Mechnikov, St. Petersburg, Russia and graduated as MD in 2002. She then joined the research group of Prof. Suvorov and prof. Uspenskiy at the Institute of Experimental Medicine (molecular microbiology department) and St. Petersburg State Medical Academy Named after I. I. Mechnikov (internal diseases department). She received her PhD degree in 2007 at the same institutions. After five years postdoctoral fellowship supervised by Prof. Suvorov and prof. Uspenskiy at the at the same institutions she obtained the position of an Associate Professor. She has published more than 38 research articles in SCI(E) journals.)

Dr. Manish Kumar Gautam

Faculty of Pharmaceutical Sciences, Assam down town University, Guwahati-781026, Assam, India

Impact of gut microbiome and intestinal parasite in immune-mediated bowel disease

Minor parasite invasion has decreased in developed nations over the past few years. Additionally, transmissible agents can defeat autoimmune conditions and hypersensitive reactions. Irritable Bowel Syndrome (IBS) and Inflammatory Bowel Diseases (IBD) are the two most common immune-mediated intestinal ailments, and a few studies have shown that a variety of protozoa and helminthes are linked to these conditions. IBD, or inflammatory bowel disease, refers to inflammatory disorders of the stomach, small intestine, and colon, including ulcerative colitis and Crohn's disease. IBD's specific cause is still unknown, however, it may be related to variations in the intestine's microflora that lead to an excessive inflammatory response to commensal microbiota. Irritable bowel syndrome is essentially a long-lasting, persistent gastrointestinal illness and symptoms typically include swelling, cramps or severe pain, diarrhoea, and constipation. The immune systems of infected hosts can be affected by various intestinal parasites, and in some situations, they can change or vary the host's immunological responses, especially in autoimmune diseases like celiac disease and inflammatory bowel disease (IBD). We found that intestinal parasites and gut microbiome have a relation for causing IBD and by maintaining the gut microbiome the disease burden may be reduced.

Keywords: Ulcerative colitis, Gut microbiota, Intestinal parasites, Inflammatory bowel disease.

Biography

Dr. Manish Kumar Gautam is an Associate Professor in Faculty of Pharmaceutical Sciences, Assam down Town University, Guwahati-781026, Assam, and India. He has completed his Ph.D. in Pharmacology from, Banaras Hindu University (BHU), Varanasi, India. He has handled and co-ordinate many extramural and intramural research projects. He has acquired more than 11 years of research experience. He has been awarded two International travel grants from the Indian Council of Medical Research (ICMR) and SERB (DST) respectively for research paper presentations in London, UK, and Malaysia. He has also been awarded “Certificate of Excellence” by EET-CRS 2nd Science and Technology award 2014. He has undergone various training programs and workshops in reputed organizations and presented more than 18 full papers/Abstracts in various national and international conferences. He contributed as a Technical Support Expert for the Development of Guidelines and consultative process “General Guidelines for Safety/Toxicity Evaluation of Ayurvedic Formulations” published by Central Council for Research in Ayurvedic Sciences, Ministry of AYUSH, Government of India, and New Delhi, India. He also contributed to 5 books and 6 book chapters and has 46 Research papers in various national and international journals. His area of research is the safety and efficacy of drugs in various animal models.

Noor A. Abdullah[1], Hoda E. Mahmoud[1], Nefertiti A. El-Nikhely[1]*, Ahmed A. Hussein[1] and Labiba K. El-Khordagui[2]

[1]Department of Biotechnology, Institute of Graduate Studies and Research, Alexandria University

[2]Department of Pharmaceutics, Faculty of Pharmacy, Alexandria University

Carbon dots labeled probiotic as a fluorescent multifunctional biocarrier for trackable anticancer drug delivery

Probiotics are currently under active investigation in biotherapy owing to their recognized safety, multiple health benefits and physiological functions. Such characteristics led to the wide use of probiotics as bioactive agents in nutritional and pharmaceutical products as well as potential biological carriers for the administration and vaccines and more recently drugs. In comparison with biomaterial-based drug carriers, probiotics are characterized by sustainability, scalability, relatively low cost, inherent biotargeting ability with possible spacio-temporal control over drug release. Simple and economic bioimaging strategies would greatly enhance the capabilities of probiotics as drug carriers by allowing visualization of the movement of the probiotic/cargo combination *in vivo* and their potential interactions with target cells *in vitro*. The aim of the present study was to develop a trackable probiotic drug biocarrier using Carbon Dots (CDs) as emerging bioactive bioimaging agents and prodigiosin (PG), an anticancer secondary red bacterial metabolite, as model drug. Heat-Inactivated *Lactiplantibacillus Pplantarum* (HILP) was labelled with glucose-derived carbon dots (CDs) to produce a fluorescent probiotic hybrid which was loaded with PG. CDs imparted green fluorescence to HILP cells and induced their aggregation as verified by Transmission Electron Microscopy (TEM) and Laser Confocal Scanning Microscopy (LCSM), respectively. HILP effectively internalized CDs probably via Glucose Transporter Proteins (GTPs) of the HILP cell membrane, forming a biostructure with retained fluorescence in PBS for a 3 month-study period at 4oC. Application of CDs/HILP as biocarrier for PG generated a stable green/red bicolor fluorescent combination permitting distinct tracking of both drug carrier and cargo. Cytotoxicity assay using Caco-2 and A549 cells revealed enhanced PG activity by CDs/HILP with synergy at different Fa levels and possible reduction of PG and CDs/HILP doses. LCSM imaging of PG-CDs/HILP-treated Caco-2 cells demonstrated improved cytoplasmic and nuclear distribution of PG as well as nuclear delivery of CDs. The CDs/HILP promoted PG-induced late apoptosis of Caco-2 cells and reduced their migratory ability as affirmed by flow cytometry and *in vitro* scratch assay, respectively. Prediction of PG molecular targets by molecular docking indicated PG interaction with mitogenic molecules involved in proliferation and growth regulation. Accordingly, CDs/HILP offers promise as multifunctional biocarrier having potential theranostic properties in addition to intracellular drug delivery and anticancer activity enhancing abilities. Findings represent an important contribution to the advancement of probiotics in the field of drug delivery and nanobiotechnology.

Audience Take Away Notes

- Probiotics which have been always considered for encapsulation as biological agents can be used for the encapsulation of drugs and their efficiency as drug biocarriers can be enhanced by fluorescence labeling for identification and bioimaging in in vitro cell culture and in vivo studies.
- Carbon dots can be used for bioimaging or probiotics and enhancing their bioactivity using a simple and economic labeling technique.
- Audience will benefit by building on the study findings for the design of more efficient drug delivery probiotic-based biocarriers.

- Finally, the study provides a model for combing nanotechnology-biotechnology-pharmaceutical technology for advancing anticancer biotherapy.
- Others can use research for expanding their research and teaching.

Biography

After finishing her Pharmacy studies, Nefertiti A. El-Nikhely got interest in Biotechnology where she got a diploma and her masters. After her PhD at Max Planck Institute for Heart and Lung Research, she took a diploma in Bioinformatics and started working at the Department of Biotechnology. Currently, she is an associate professor of biochemistry and molecular biology at the Institute for Graduate Studies and Research, Alexandria University. There, she started establishing a research line on the use of natural products with a focus on cancer. In addition, she is interested in the development of therapeutically important proteins.

Diana Catalina Castro Rodriguez
Catedras, CONACYT, National Institute of Medical Sciences and Nutrition Salvador Zubiran, Mexico

Benefits of probiotic consumption in early stages of development

It consists of basic concepts about the origin of the microbiota, how it is modified by maternal nutrition, the effects on offspring development, and possible interventions using functional foods, mainly probiotics as alternatives to prevent or improve the negative effects of poor maternal programming and its effect on the microbiota.

Audience Take Away Notes

- Importance of adequate nutrition in early stages of development such as pregnancy and lactation.
- Beneficial effects of the use of probiotics in fat reduction.
- Characterization of bacteria with probiotic potential.

Biography

Diana C. Castro Rodríguez has PhD in Science in Bioprocesses. She is currently a young researcher from CONACYT. She has carried out two research stays, one at the Institute of Agro chemistry and Food Technology, Valencia, Spain and another at Texas Biomedical Research Institute and Southwest National Primate Research Center, San Antonio, United States. She has three patent application records. She has been awarded honorable mentions for her work in both the Master's and PhD. Her line of research is aimed at the bio-synthesis of the secondary metabolites of probiotic and their effects in chronic degenerative diseases.

Hebe T. Fernandez

Department of Agronomy, National University of the South, Bahía Blanca, Buenos Aires, Argentina

Modifications induced by dietary chia meal and probiotic on carcass traits, internal organs and blood chemistry in Argentina poultry production

The composition of the diet is a key factor that contributes to efficient and sustainable animal production. Currently, there is a growing interest in researching possible alternatives in the diet that favor growth and health of birds. Diets enriched with omega n-3 polyunsaturated fatty acids (n-3 PUFA) have a beneficial effect on the immune system, enhancing growth and resistance to poultry diseases. Additionally, pprobiotics are live microorganisms, when administered in adequate amounts confer a fitness benefit on the host. There is little information on the combined use of probiotics and a source of n-3 PUFA related to the potential synergistic effect of both components in broiler diets. Probiotics promote the absorption of n-3 PUFA, and these fatty acids enhance the adhesion of probiotics to the intestinal mucosa. The present research deals with the effect of the addition in the diet of chia meal (*Salvia hispanica L.*; DESUS S.A, Argentine) and/or a probiotic (*Bacillus subtilis*; Laboratorios Biotay, Argentine) on internal organs, blood metabolites and carcass traits of broiler. The results obtained in this work indicate that the addition of 250 g/ton 1x109 UFC of Bacillus subtilis or/and 15% chia meal in broiler diet did not affect productive parameters and commercial cuts. The lack of synergic effect between n-3 PUFA and the probiotic in performance could be due to the mucilage (soluble fibre) present in chia meal that affects the absorption of nutrients and adhesion of *Bacillus subtilis* to intestinal mucosa through biofilm formation. Moreover, n-3 PUFA could decrease probiotic growth capacity by inducing changes in the fluidity of the microorganism's membrane (Gram +). Further, there is valid to consider that the bacteria can capture PUFA, decreasing their availability for metabolic purposes. Also, higher small intestinal weight was observed in chia meal diet, which would increase the metabolic activity of the digestive organs, increasing maintenance requirements and thereby decreasing energy for animal production. Finally, the inclusion in the diet of n-3 PUFA through chia meal downgrade liver weight reducing hepatic lipogenesis, leading as a consequence to a liver-protective effect. Also, Bursa of Fabricius weight was increased and cholesterol levels were decreased, which could be related to a higher immune condition and an improvement in blood chicken homeostasis. *Bacillus Subtilis* is a probiotic that can safely be used in broiler production without negative effects. In our current study, diets containing 250 g/TN 1x109 CFU combined with 15% chia meal were novel. Further research is needed to determine other exposure times and doses, as well as methods for mucilage extraction from chia meal.

Audience Take Away Notes

- The research presented in this work will lay the groundwork for future research allowing the use of new additives or deepening into the compounds presented. Currently, there is a growing interest in investigating possible alternatives in the diet of broilers that result in obtaining heavier, healthier and cost-effective animals.
- The knowledge of the effects of the addition of a dietary by-product of the agroindustry, chia meal combined with Bacillus Subtilis appears as being limited. In our current study, diets containing 250

g/TN 1x109 UFC of Bacillus subtilis with 15% chia meal were novel. Further research is needed to determine other exposure times and probiotic doses as well as methods for mucilage extraction of chia meal.

- Actually, all concepts imparted in this talk are used in several signatures dictated at the Department of Agronomy with the objective to promote student interest.
- The information imparted in this presentation will allow understanding of the importance of the addition of probiotics to the diet and their effect on blood health and broiler production as possible growth promoters reducing or replacing the use of antibiotics.
- Blood parameter balance evaluation (homeostasis) helps to determine the animal's physiological condition. These notions will allow the audience to understand the possible biochemical effects of supplementation under study
- On the other hand, it will raise awareness about the importance of using agro-industrial by-products as an ingredient in animal diets, as a way of adding value to the production system.
- It provides new information for professionals since the use of low-cost agro industrial by-products is expected to improve animal performance and reduce costs by replacing part of cereals. Moreover, probiotics allow replace the use of antibiotic growth promoters with natural additives in order to obtain high-protein feed, optimize intestinal health, immune status and production parameters in broiler chickens.
- This presentation transfers promissory experiences on the importance of the use of these by-products encouraging the development of new trials, as well as, their diet incorporation to provide greater health benefits.

Biography

Dr. Hebe T. Fernández graduated as Veterinary at the National University of La Plata, Argentina. She then joined as a professional teaching research assistant at the Department of Agronomy of the National University of the South (UNS), Bahía Blanca. She received the M.Sc. postgraduate degree in 2001 at the same institution, later obtained the position of an Associate Professor. Since 2013 she is the Director of the Poultry Broiler Experimental Unit (UEA) of the Department of Agronomy directing grade and posgrade students. The main line of research focuses on the production of sustainable broilers, investigating alternatives in the management of the diet that lead to direct benefits on performance and animal health, as well as meat with higher nutritional value and hygienically safe for public health. Regarding her personal life, she is married and has three sons, loves caring for stray animals and enjoys playing the piano.

Jenny L. Sones[1]*, Kalie F. Beckers[1], Chin-Chi Liu1, Christopher J. Schulz[2], Gary W. Childers[2]

[1]Veterinary Clinical Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA, United States
[2]Department of Biological Sciences, Southeastern Louisiana University, Hammond, LA, United States

Lactobacillus dominates the gut microbiome of Blood Pressure High (BPH)/5 mice after weight loss and attenuation of hypertension

Obesity in women before and during early pregnancy has been associated with adverse outcomes, including preeclampsia. Early pregnancy weight gain in mothers is predictive of adverse cardiometabolic outcomes in offspring. Obese BPH/5 female mice that are hyperphagic have increased blood pressure with pregnancy mimicking women with obesity that develops preeclampsia. BPH/5 pregnant gut microbiome is populated by high abundance of Alistipes, which are major producers of pro-inflammatory Lipopolysaccharide (LPS), and decreased Bacteroides and Lactobacillus, which are high in normal pregnancies. By pair-feeding BPH/5 to control mice, we match food intake in early and mid-pregnancy and prevent excess weight gain and late gestational rise in blood pressure and restore Bacteroides and Lactobacillus. We hypothesized BPH/5 offspring born to pair-fed dams would have attenuation of cardiometabolic disease and a gut microbiome containing higher Lactobacillus. Lactobacillus is thought to play a major role in preventing overgrowth of pathogenic bacteria. Bacterial vaginosis is characterized by a reduction in Lactobacillus, which would be a dysbiosis of the natural vaginal microbiome and could be detrimental to pregnancy. During healthy pregnancies an overall increase in general, Lactobacillus and Bacteroides, within the vagina has been shown. Intravaginal therapies during pregnancy may not be advised, therefore oral probiotics hold promise to improve pregnancy outcomes. Ad libitum fed BPH/5 females born to pair-fed dams have lower body weight and adiposity, reduced blood pressure, and higher Lactobacillus in their gut microbiome. In summary, our defined time and specific intervention improves PE associated adverse outcomes will provide fundamental data to pursue additional novel mechanisms for improved women's health across the lifespan.

Audience Take Away Notes

- This research highlights the importance of the gut microbiome in models of cardiometabolic disease, including pregnancy-related preeclampsia.
- Altering the gut microbiome through diet may prevent cardiometabolic disease in mothers and offspring born from adverse pregnancies.
- Inclusion of microbiome research and testing probiotics to alter the microbiome have potential for reversing inherited obesity and hypertension.

Biography

Jenny Sones is an Associate Professor of Theriogenology at Louisiana State University (LSU) School of Veterinary Medicine. I received my Bachelor of Science in 2004 and Doctor of Veterinary of Medicine degree in 2008, both from LSU. At Cornell University, I received a PhD in reproductive physiology and genomics with Dr. Robin Davisson, completed a T32 postdoctoral fellowship in reproductive immunology, and residency training in Theriogenology. My research focuses on preeclampsia and fetal growth restriction using a mouse model, BPH/5.

Thaisa Cantu-Jungles*, Nuseybe Bulut and Bruce Hamaker
Whistler Center for Carbohydrate Research, Department of Food Science, Purdue University, West Lafayette, Indiana

Fine-tuned prebiotic fiber structures to effective support probiotic-type bacteria

Prebiotics are dietary fibers that ferment in the large intestine to promote local and systemic effects that are beneficial to human health. However, most dietary fibers currently utilized as prebiotics are not well aligned to the bacteria they target, and present different and unpredictable responses in individuals harbouring distinct microbial communities. This presentation will provide a new view of prebiotic design and selection that is effective to support probiotic-type bacteria with high consistency across individuals. Our data from multiple in vitro fecal fermentations experiments indicate that dietary fiber structures relate to prebiotic efficacy in different people. Dietary fibers with a higher degree of structural complexity can to precisely align and promote targeted probiotic-type bacteria in the gut with predicted short chain fatty acid response, regardless of differences in community structures among individuals. On the other hand, fibers of low structural complexity, such as fructans, have varied microbiota and short chain fatty acid metabolic response in individuals, with little targeted response. We will further demonstrate how a laboratory protocol for prebiotic selection that matches probiotic-type bacteria can be effective towards promotion of Faecalibacterium prausnitzii in vitro. Overall, we will demonstrate for prebiotics matched to support probiotic-type bacteria produce more intense, homogeneous, and predictable microbiota responses in different individuals. Such prebiotics have potential applications to support gut-resident or orally-delivered probiotics.

Audience Take Away Notes

- This presentation will explain how prebiotics can be designed to support specific probiotic-type bacteria.
- Similarity and intensity of responses across people through the use of structurally fine-tuned prebiotics will be explored
- The presented technologies to prebiotic design have the potential to support gut-resident or orally-delivered probiotics in a targeted and predictable way.

Biography

Dr Cantu-Jungles has earned her M.S. and Ph.D. in Biochemistry from the Federal University of Parana (Brazil) and has joined the Food Science department at Purdue University as a postdoc in 2018. Her research has focused on how physico-chemical structures of dietary fibers can affect growth and metabolism of gut bacteria, with an ultimate goal to promote human health. Her focus has been on the selection and modification of dietary fiber structures for gut microbiota modulation, targeted promotion of specific bacterial taxa and inter-individual variability in gut microbiota-fiber responses.

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DAY 01

POSTERS

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Adineh Tajmousavilangerudi
University of Bolzano, Italy

Functional beverage to improve immunity of body

The SARS-Cov-2 pandemic has exposed our vulnerability to new illnesses and novel viruses that attack our immune systems. SARS-Cov-2 rapidly becomes a pandemic and is currently prevalent in most nations. The vaccine is being gradually introduced over the world, but new strains of the virus and COVID-19 will emerge and continue to cause illness. COVID-19 is more susceptible against older people. Aging is associated with significant changes in that physiology, which reduce the ability to fight infection or, once infected, to develop effective immune responses to limit symptoms and disease progression. Cellular aging can induce metabolic imbalance by increasing the synthesis of inflammatory products. Mucous secretion alterations, reduced motility, and notably gut micro biota changes have a negative impact on the intestinal physiology. Dietary changes and protein deficiency eventually result in a loss of lean muscle mass and an increase in fat deposits, which contribute to inflammation, systemic and metabolic dysregulation, like obesity. It is becoming increasingly evident that metabolic health is closely intertwined to immune function, particularly the regulation of inflammation. The malfunction and inflammation associated with age, determine the risk of chronic diseases, frailty progression and the risk of serious disease in the case of viral infection (4- 6). It is worth noting that dietary intervention can reduce the risk of both metabolic and associated inflammatory diseases (3). In this regard, older people who followed a Mediterranean-style diet, rich in polyphenols and dietary fiber, performed better physically and mentally. This demonstrates the importance of the human gut microbiome in transforming complex dietary macromolecules into most biologically available and active nutrients (e.g., short-chain fatty acids, small phenolic acids, derivatives of amino acids) which subsequently help to regulate metabolism and both intestinal and systemic immune function (1,7). The role of lactic acid fermentation is prominent also as a powerful tool for improving the nutritional profile of human diet by releasing nutrients and boosting the complex bioactive compounds and vitamin content. According to several clinical trials (4), 16 studies of probiotics, 88 of vitamin D and 100 of antioxidants against COVID-19 are currently under investigation or completed. As a result, the formulation of a multi-bioactive nutritional support based on fermentation aiming at immune modulation of the intestinal microbiome for elderly, represents a great promise in generating natural formulations to reduce the burden of SARS-Cov-2 and other future infections of the respiratory tract.

Biography

Adineh Tajmousavilangerudi is from University of Bolzano, Italy.

Yonghong Li*, Yingying Liu, Lifei Feng, Keke Li

School of Phamarceutical Science, Zhengzhou University, Zhengzhou, Henan, China

Coculture process of *Clostridium butyricum* and *Bacillus coagulans*

Clostridium butyricum is a spore-forming probiotic which can promote the enhancement of beneficial bacteria and maintain intestinal micro ecological balance. However, it is difficult to improve the production level of *C. butyricum* by conventional fermentation process. In this study, a co-fermentation process of *C. butyricum* DL-1 and Bacillus coagulans ZC2-1 was established to improve the viable counts and spore yield of *C. butyricum*, and the formula of coculture medium was optimized by flask fermentation. The results showed that the optimum medium composition is 10 g/L glucose, 15 g/L corn steep powder, 15 g/L peptone, 1 g/L K2HPO4 and 0.5 g/L MnSO4.Cultured stationarily in the optimal medium for 36 h, the concentration of viable bacteria of *C. butyricum* DL-1 reached 1.5× 108 cfu/mL, Which was 375 times higher than that incubated in the initial medium. The sporulation rate reaches 92.6%. The results revealed an economical and effective medium composition for the coculture of *C. butyricum* and B. coagulans, which achieved a 64.6% cost reduction. After fermentation process optimization in 10 L and 50L fermentation tank, the concentration of viable bacteria of *C. butyricum* DL-1 reached 5.8× 108 cfu/mL and 9.2 cfu/mL, respectively, this is near the fermentation level of *Clostridium butyricum* anaerobic culture in nitrogen atmosphere. The co-fermentation process established in this study provides a new fermentation mode for the industrial production of other absolute anerobic bacteria.

Audience Take Away Notes

- The audience could know new probiotic strains-- *Clostridium butyricum* and *Bacillus coagulans*,
- The audience could know the properties and usage of the two strains.
- learn a new fermentation mode, and solve the difficult they met in absolute anerobic bacteria fermentation.

Biography

Dr. Yonghong Li studied Fermentation engineering at Jiangnan University, Wuxi, China and graduated as PhD in 2004. She then joined the research group of Prof. Hongmin Liu as postdoctoral fellowship at Chemistry department, Zhengzhou University. And obtained the position of an Associate Professor of Zhengzhou University at 2006. She has hosted 10 enterprise-cooperative projects, obtained 8 China authorized patent and published 11 research articles in SCI journals.

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DAY 02

KEYNOTE FORUM

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Potential use and benefits of prebiotic-rich medicinal plants and mushrooms in honey bee feeding

In the literature, it has been reported that some medicinal plants or mushrooms can be thought of as prebiotics source and their uses can help to strengthen the immune and regulate the reduction systems of honey bees. They can also increase the productivity of honey bees. So that this study aimed to present the possible benefits of medicinal plants and mushrooms rich in prebiotics for honey bee feeding. Extracting a certain prebiotic from plants and using it to feed honey bees can cause high costs. The use of extract or ground herbs rich in prebiotics seems to be more reasonable. It is also thought that more beneficial effects can be seen on honey bees with a synergistic effect thanks to the phenolic component, other polysaccharides, and other specific components other than the prebiotic content of plants mushrooms. The presence of pesticides and veterinary drug residues in bee products and other primary food production, especially honey, is an important risk. In recent years, it has become popular to use natural methods in the production of bee products, as in all food production. In this way, consumers can buy food products way more safely. It is thought that less disease and less need for spraying can be an important gain for honey bees that are supported by natural methods in terms of health. Only a few types of prebiotics have been reported such as □-glucans, inulin, lactulose, polydextrose, galactooligosaccharides, fructooligosaccharides, soybean oligosaccharides, and iso-maltooligosaccharides. Prebiotics are found in different plant and mushroom sources (chicory, asparagus, chia seeds, dandelion greens, garlic, artichoke, oats, shiitake, reishi, and oyster mushrooms, etc.). There is a big interest to find new prebiotics with more health benefits and/or lower costs. Medicinal plants, medicinal mushrooms, and edible mushrooms are seen as special and new prebiotic sources. It is reported that prebiotics can indirectly inhibit pathogenic microorganisms by promoting the development of probiotic microorganisms. In addition, it can show protective effects on honey bees by supporting the immune system against negative environmental factors. In some studies, it has been stated that probiotic bacteria can protect honey bees from diseases thanks to their antagonistic activity against a wide range of pathogenic microorganisms. These reports lead to the idea that prebiotics can be used in veterinary medicine applications and to strengthen the immunity of bees. The use of plants or mushrooms as a source of prebiotics supports natural beekeeping activities. In this way, it will be able to contribute to environmental and sustainable beekeeping and agriculture, as well as consumers' expectations of natural honey production.

Yasin Ozdemir[1]*, Seda Kayahan[1], Selcuk yaman[2], Mustafa Alaybeyoglu[3]

[1]Food Technologies Department, Ataturk Horticultural Central Research Institute, Yalova, Turkiye

[2]Yalova Provincial Directorate of Agriculture and Forestry, Yalova, Turkiye

[3]Yalova Province Beekeepers Association, Yalova, Turkiye

Biography

Dr. Yasin Ozdemir studied Food Engineering at Ege University, Türkiye, and graduated with an MS in 2004. He received her Ph.D. degree in 2011 at Namık Kemal University. During Ph.D. studies he started to work at Ataturk Horticultural Central Research Institute. He has 3 processes patents and 2 national awards in his scientific study area. He is currently leading 4 national research projects which supported by the Republic of Türkiye Ministry of Agriculture and Forestry, the General Directorate of Agricultural Research and Politics (TAGEM) and 5 private sector-supported food technology projects. Dr. Ozdemir also takes parts as a researcher in an international project focused on bioavailability and food science/ technology. He published more than 100 articles in international journals and congress proceedings.

Audience Take Away Notes

- Potential uses and benefits of medicinal plant and mushroom prebiotics for honey bee feeding.
- Beekeepers, bee products (honey, propolis, pollen etc) traders and consumers can be learn some information to be used.
- Veterinary, agriculture, beekeeper, and prebiotic/probiotic scientist can use ideas in this study.
- Natural prebiotic sources can be used in bee keeper sector. Bee product traders and salesman can use these ideas for futuristic marketing tools.

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DAY 02

SPEAKERS

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Jian-Yong WU

Research Institute for Future Food and Department of Food Science & Nutrition, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Prebiotic properties and health benefits of bioactive natural polysaccharides

Natural polysaccharides (PS) from various sources have been recognized as promising nutraceutical and therapeutic ingredients because of their multiple bioactivities and health benefits such as immunomodulation, anti-tumor, anti-oxidant, anti-inflammation, and amelioration of metabolic syndrome diseases. As most of the bioactive natural PS is highly resistant to digestive enzyme and gastric acid hydrolysis and to absorption in the small intestine in the human Gastrointestinal Tract (GIT), they are most probably metabolized by the gut bacteria in the large intestine. The fermentative metabolism of natural PS by the gut bacteria yields metabolites such as Short Chain Fatty Acids (SCFAs) that are beneficial and important to both the intestinal and systemic functions and may also modulate the gut microbiota beneficially to the host health. Many recent studies have demonstrated the prebiotic properties of natural PS and provided supporting evidence for an important role of the gut microbiota in medicating the various health benefits and therapeutic effects of bioactive natural PS. This lecture will cover the following contents:

- Bioactive natural PS: Sources, molecular characteristics and health benefits.

- Gut microbiota and prebiotic properties of natural PS;

- Findings from our research studies: (1) prebiotic properties of PS from a medicinal fungus, Cs-HK1 EPS and konjac GlucoMannan (KGM); (2) anti-inflammatory effects of Cs-HK1 EPS.

Audience Take Away Notes

- To learn about the molecular properties, health benefits and potential applications of natural polysaccharides.
- To understand how the natural polysaccharides generate the health benefits in human.
- To identify the important areas for research and development on natural polysaccharide.

Biography

Dr. JY Wu is a full professor at the Hong Kong Polytechnic University (PolyU). He has published more than 200 peer-reviewed scientific papers, receiving over 8300 citations and an H-index 58 on Scopus, and listed as top 2% most cited scientist by Stanford University in 2021 and 2022. He is an editorial board member for several scientific journals. His major areas of research interest: Bioprocesses for medicinal fungi; Natural and bioactive polysaccharides; Functional foods, prebiotics and gut microbiota; Ultrasound-assisted processes for food and natural products.

Kasi Sowjanya Lakshmi R[1], Anju Kala[1]*, A K Verma, L.C. Chaudhary[1], Z. B. Dubal[2]

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[2]Veterinary Public Health Division, ICAR-Indian Veterinary Research Institute, Izatnagar, India

Calf- gut origin lactobacillus ruteri and jerusulam artichoke synbiotics modulated the gut microbiota to restore antimicrobial sensitivity after antibiotic feeding

A 42 days study was designed with the hypothesis that functional foods like synbiotics can modulate the gut antibiotic sensitivity and hence antimicrobial resistance. For this 48 Wistar rats with similar gut microbial profile (based on fecal antibiotic sensitivity) were selected. And screened for most effective and least effective antibiotic based on fecal antibiotic sensitivity. Ciprofloxacin and Ampicillin were observed to be the most effective and least effective antibiotics on rat gut microbiota. These two antibiotics were fed to selected group of rats as per the experimental protocol. The treatment groups were Control, SYN, AMP, AMP+SYN, CIP, CIP+SYN. Control group was fed Basal diet, whereas other groups were fed basal diet along with treatment, Synbiotic Limos lactobacillus ruteri RM125MT903467 @108 cfu/ml+ JAT powder @2% of B.Wt in SYN, antiobiotics in AMP and CIP for 14 days, and in AMP+S and CIP+S antiobiotics for 14 days followed by synbiotic supplementation. In order to study the effect of synbiotic supplementation on fecal antibiotic sensitivity, weekly faecal microbial antibiotic sensitivity of rats was recorded against representatives of six groups of antibiotics (Ampicillin (AMP), Chloramphenicol(C), Ceftriaxone (CTR), Co-trimaxazole (COT), Ciprofloxacin (CIP) and Tetracycline(TE). Feeding of antibiotics either CIP or AMP resulted in significant reduction in zone of inhibition of faecal microbiota for all tested representatives of six groups of antibiotics (Ampicillin, Chloramphenicol, Ceftriaxone, Co-trimaxazole, Ciprofloxacin and Tetracycline) by 2nd week. Based on the zone of inhibition (ZOI) as per the ABST profile, it can be observed that the ZOI remained lower in all groups till week2. After that, increase in ZOI was observed initially for syn group followed by control. For other antibiotic fed groups (AMP, AMP+S, CIP, CIP+S) increase in ZOI appeared later in experiment. Also, the highest ZOIs were observed for synbiotic fed groups with or without antibiotic. Further the comparative effect of feeding synbiotic with and without the antibiotic was done for least sensitive antibiotic (Ampicillin).It was observed that the ZOI was higher for the synbiotic fed group (SYN) for most of the antibiotics tested. In ampicillin fed group, ZOI was lower against ampicillin antibiotic tested or equivalent to control for other antibiotics tested. Interestingly, in ampicillin followed by synbiotic group (AMP+S), the ZOI improved and was at par with the SYN group for most of the antibiotics tested. Similarly, the most sensitive antibiotic (ciprofloxacin) was fed to rats with or without synbiotic. It was evident that the mean ZOI of gut microbes of was similar in synbiotic and control group, whereas the ZOI of rat group fed ciprofloxacin (CIP) deceased than control showing greater resistance to some of the antibiotics tested. Feeding of synbiotic (CIP+S) did increase the ZOI of rats fed ciprofloxacin. There was no significant effect of treatments on weekly body weight gain and dry matter intake. However, supplementation of synbiotic reduced the daily feed intake in ciprofloxacin treated group. Cell mediated immune response of rats tested by intradermal injection of phytoheamagglutinin-P (PHA-P) antigen showed that feeding of antibiotics (AMP, CIP) and synbiotic significantly improved the immune response as compared to control group.

Audience Take Away Notes

- Feeding of antibiotics decreased the fecal antibiotic sensitivity in rats fed antibiotics,
- Feeding of synbiotic provided improved fecal antibiotic sensitivity in rats fed on basal diet (control),
- Feeding of synbiotic after antibiotic administration did increase the fecal antibiotic sensitivity in rats fed antibiotics being at par with control.

Biography

Dr. Anju Kala completed her BVSc in 2007 from G B Pant University of Agriculture and Technology with vice chancellors gold medal. She did her MVSc (2009) and PhD (2017) from Indian Veterinary Research Institute, Izatnagar. She started her research career as scientist in 2015 at Indian Veterinary Research Institute. She has more than 75 publications in reputed research journals, invited lectures, compendia and books. Her main area of research is study of rumen microbial ecosystem, manipulation of rumen ecosystem for improving better utilization of poor quality roughages, reduction in methanogenesis, development of probiotics, prebiotics and synbiotic products for animals.

Arpita Banerjee, Pubali Dhar*
University of Calcutta, Kolkata, Bengal, India

Prebiotic activity of enzymatically extracted soluble dietary fibres from oil seed meals

Prebiotics stimulates the growth of probiotic beneficial bacteria and fungi. Prebiotics can be degraded by intestinal microbial organisms. Dietary Fibre (DF), stimulate the growth of probiotics and can be classified as Soluble Dietary Fibre (SDF) and Insoluble Dietary Fibre (IDF). DF is one such nutrient that is abundantly available in the de-oiled meals. The present study deals with isolation of soluble fractions of DF from de-oiled meals, by enzymatic extraction. This is followed by the evaluation of its various anti-oxidative and functional properties to estimate its applicability as a nutraceutical and also for incorporation in functional food. The oilseedsם mustard, sesame, rice-bran and linseed were collected from Kolkata, West Bengal, India and after oil-production, the de-oiled cakes generated from the aforementioned oilseeds were procured from Vinayak Oil and Fats Private Limited, Howrah, West Bengal. SDF was extracted according to the AOAC enzymatic-gravimetric method. The characterisations of the enzymatically extracted SDF was done. The biological activities of the enzymatically extracted SDF were evaluated. Water soluble M-SDF, S-SDF, RB-SDF and LS-SDF were enzymatically generated that showed some non-nutritional functions due to the polyphenols masked in them. Fibre acquired from food industry wastages are a better alternative to and can partially replace flour, sugar, fat, as they are non-caloric, inexpensive, bulking agents with auxiliary health advantages.

Biography

She currently serves as a Professor at the Laboratory of Food Science & Technology, Food & Nutrition division, Home Science Dept. University of Calcutta and Associate faculty of Centre for Research in Nanoscience and Nanotechnology (CRNN). Her research team is primarily engaged in exploring functional food and nano lipid technology. Having an h-index of 16, i10 index 27, and >50 publications with citations and post-graduate teaching experience over 20 years, she has demonstrated her research and teaching acumen quite conspicuously and consistently. She has supervised 12 Ph.D thesis and over 8 students are presently working. She has been awarded with the Dr. S. Hussain Zaheer Memorial award, 2007 for best research contribution in lipid technology instituted by Zaheer Science Foundation, New Delhi, an integral member of Oil Technology Association of India, P.B. Sen memorial award, 1999 by the Physiological Society of India, New Delhi. She has been awarded Dr. S D Thirumala Rao Memorial Award 2015 in the70th Annual Convention of OTAI and most prestigious Mrs. Sakuntala Dasgupta memorial award for research in the field of nutrition by Physiological Society of India (PSI) in 2016. She is the Assistant Head of the OIL LABORATORY, Department of Chemical technology.

Valeriy Pogorelov, Olexii Pogorelov*
Department of Physics, Kyiv National Taras Shevchenko University, Ukraine

Features of cluster structures of supercooled water and methanol

In the gas phase at low pressures, water is a collection of isolated molecules. The vibrational spectrum of such water consists of one deformation and two stretching vibrations. In the liquid phase, the vibrational spectrum of water becomes much more complicated. This effect is due to the fact that the approach of molecules in a liquid leads to the formation of molecular clusters. The vibrational bands inherent in the gas phase are split and shifted to the low-frequency region. Instead of narrow lines in the gas phase, wide bands are fixed in liquids. The low-frequency shift of such vibrational bands increases with the number of molecules in the cluster. At normal external pressure, as the temperature decreases, monomers, dimers, trimers, tetramers, and a small number of clusters with a large number of molecules in them are fixed in the structure of liquid water. At temperatures below 273 degrees Kelvin, pentamers begin to predominate in the structure of water and hexamers appear. The symmetry of pentamers suggests the presence of a 5th order symmetry axis. However, such structural elements cannot be part of crystalline structures. For the formation of a crystalline structure in water, it is necessary to further decrease its temperature and the predominance of clusters in its structure, consisting of six molecules - hexamers. In the temperature range in which the predominance of pentamers in the structure of water changes to the predominance of hexamers, crystalline water cannot form. The water is in a supercoiled state. It is interesting to note that the supercooled state of water is observed only when it is cooled from the liquid phase. When ice is heated, water passes from a crystalline state to a liquid state without intermediate stages. Similar processes are observed in methanol.

Audience Take Away Notes

- I think that the audience can use this information at the preparing of new probiotic.

Alisha Sharma[1], Anju Kala[1]*, L.C. Chaudhary[1], Payal Agarwal[1], J. J. Rokade[2]

[1]Animal Nutrition Division, ICAR-Indian Veterinary Research Institute, Izatnagar, India

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Supplementation of encapsulated multispecies probiotic improved gut health indicators in rats

The study was conducted on weaned Wistar rats procured from the Laboratory Animal Research section of divided into four groups-Con (fed with basal diet), Pro (supplemented with multispecies probiotic, MSP), ProE (Supplemented with Encapsulated MSP) and ProL (Supplemented with Lyophilized MSP). The Multispecies probiotic was characterized and developed (Waghe et al., 2022; Kala et al., 2022) and later encapsulated or Indian Veterinary Research Institute, Izatnagar, UP, India. A forty-two-days rat trial was conducted and the rats were randomly lyophilized (Sharma et al., 2022) in author's laboratory. During the course of our study, fecal microbiology, pH, fecal metabolites as short chain fatty acids, lactic acid and ammonia concentrations were determined fortnightly (on 14th, 28th and 42nd day) in rats as gut health indices. Also, a four days digestion trial was conducted after one month of feeding the MSP. Towards the end of the experimental feeding, the intestinal morphometry and histology of the gut sections like jejunum and caecum was also done. We observed that adding MSP to rats' diets considerably reduced the population of Salmonella and coliforms while significantly increasing health-promoting microorganisms like Lactobacillus and Bifidobacteria. Likewise, upon comparing the MSP-supplemented groups to the control group, the Pro, ProE and ProL groups had considerably higher fecal lactate concentrations and lower fecal ammonia levels. The concentration of fecal lactate, Lactobacillus and Bifidobacteria increased, while fecal ammonia and coliforms decreased as the experimental feeding progressed. We also found significantly higher levels of fecal acetate, propionate, butyrate, and total short-chain fatty acids in MSP-supplemented groups, that increased as the experiment progressed. However, the digestibility of nutrients like dry matter, organic matter, crude protein, ether extract, and crude fiber remained similar in all the groups. The histological analysis of intestinal segments revealed that MSP supplementation significantly increased the mean villi height of jejunum, caecum and colon, being higher in ProL followed by ProE. Apart from this, there was a significant increase in the crypt depth of jejunum and caecum in MSP supplemented groups indicating lesser damage and thus lower requirement of epithelial renewal as indicated by more crypt depth. The mean lengths of the entire intestine and its segments, duodenum and colon showed similar results across all treatment groups. The mean widths of intestinal segments were greater in the MSP-supplemented groups than in the control group which could be attributed to the trophic effect of probiotics. The absolute and relative organ weights were comparable across all treatment groups in rats.

Conclusions: Supplementation of the probiotic products (Pro, ProE and ProL) significantly enhanced the population of health-positive microbes (Lactobacillus and Bifidobacteria) while decreasing the counts of harmful microbes (Coliform and Salmonella) with a concurrent increase in fecal lactate and reduction in ammonia concentration, showing improved overall intestinal health. Within the different MSP groups, the beneficial effects in improved gut health attributes were more pronounced in ProE group as compared to other MSP groups.

Audience Take Away Notes

- Encapsulation of probiotics can enhance shelf life of probiotics and reduces the need of sub culturing the probiotic for its maintenance,
- Easy and effective administration, storage and transportation of probiotic,
- Encapsulated probiotics proved to be superior to as such probiotic culture in in vivo study (rat trial).

Biography

Dr. Anju Kala completed her BVSc in 2007 from G B Pant University of Agriculture and Technology with vice chancellors gold medal. She did her MVSc (2009) and PhD (2017) from Indian Veterinary Research Institute, Izatnagar. She started her research career as scientist in 2015 at Indian Veterinary Research Institute. She has more than 75 publications in reputed research journals, invited lectures, compendia and books. Her main area of research is study of rumen microbial ecosystem, manipulation of rumen ecosystem for improving better utilization of poor quality roughages, reduction in methanogenesis, development of probiotics, prebiotics and synbiotic products for animals.

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Probiotic and prebiotic effect of breast milk on baby nutrition

Breast milk contains carbohydrates, proteins, fats, vitamins, water and minerals necessary to perfectly meet the nutritional and immunological needs of the baby, as well as various bioactive components necessary for the health of the baby. The protective property of breast milk baby against infectious diseases is due to its anti-infective effect. This effect is because bioactive components such as immunoglobulins, immune cells, antimicrobial acids, polyamines, oligosaccharides, lysocystic, lactoferrin in colostrum. Although the formation of microbiota in the human body begins in the prenatal period, it is mainly shaped in the first three years of life and diet plays an important role in the baby's development of a healthy microbiota. Breast milk is critical for the formation of a healthy gut microbiota, especially in the first months of life. Recent studies have shown that human milk, far from being a sterile liquid, constitutes an excellent and constant source of commensal bacteria for the infant gut. These bacteria may also play an important role in reducing the incidence and severity of infectious diseases in breastfed children. Among the bacteria found in human milk, those belonging to the species Staphylococcus, Lactococcus, Enterococcus, Lactobacillus and Bifidobacterium spp. are the most common. There is a growing interest in Lactobacillus species found in breast milk, such as L. gasseri, L. salivarius, L. rhamnosus, L. plantarum and L. fermentum, because they are considered potentially probiotic species. Probiotics are defined as living microorganisms that, when administered in sufficient amounts, provide a benefit on the host (FAO/WHO, 2006). Healthy microbiota development in the baby is associated with the health of the mother's microbiota. Especially the first 3-4 months are critical in microbiota development. Bacteria that pass through the vaginal, fecal, and skin microbiota of the mother are the first microorganisms to colonize in the newborn's gut. In the literature, the effect of microorganisms in breast milk on the development of the baby's microbiota has been shown by various studies. The transmission of breast milk microbiota to the baby occurs as a result of very complex and developed processes. The studies were compared with breast milk and microorganisms in mother and baby's feces and it was determined that some bacterial species were common. These studies have revealed that there is a vertical transfer of bacteria from mother to baby through breastfeeding, which in this case affects the development of the baby's intestinal microbiota. In addition, animal studies have shown that the bacteria in breast milk have the potential to colonize the baby's intestines. Oligosaccharides in breast milk play a key role in the formation of baby's gut microbiota by showing prebiotic effects. Studies have determined that the number of Bifidobacterium spp. in infant feces they examined at the end of the one-month lactation period showed a complete correlation with the oligosaccharide content of breast milk. With this feature, breast milk is thought to be the first and most important prebiotic. The oligosaccharides and microbiota found in human milk are of particular interest because of their effects on the baby's gut microbiota and potential long-term health. In this study, it was aimed to evaluate the results of the prebiotic and probiotic effects of breast milk by reviewing the studies examining the effect on microbiota development.

Key words: Breast milk, Probiotic, Prebiotic, Nutrition.

Audience Take Away Notes

- Breast milk composition and the effect of breast milk on infant health will be evaluated. Information about the probiotics and prebiotics contained in breast milk will be gained. For a healthy life, the importance of intestinal microbiota in the first stage of life and the contribution of breast milk will be learned.
- This information will be a guide for the work of the audience on these issues.
- Idea will be obtained about the studies to identify probiotic bacteria from breast milk and to find use of these bacteria industrially in the production of baby food.
- In the preparation of baby food formulas, it will be guided for gaining probiotic and prebiotic effects similar to breast milk.

Biography

Dr. Aslı Akpınar studied dairy technology at the Ege University in Institute of Science, Turkey and graduated as M.Sc degree in 2008 and PhD degree in 2015 at the same institution. During her master's and doctorate, she worked as a research assistant at the same university. After the end of the PhD, she worked as a lecturer for 6 months in Odemiş Vocational High School. In 2016, she obtained the position of an Assistant professor at Manisa Celal Bayar University Department of Food Engineering. In 2022, she obtained the position of an Associate Professor at the same university. She has published more than 35 research articles in SCI and ISI journals, 7 book chapter.

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Enhancing probiotic intervention for control of biofilm former Escherichia coli isolates of animal-origin foods

Biofilm formation is a survival mechanism and adaptation strategy of microbes that allows them to live on food and food-contact surfaces for extended periods of time. Apart from causing adverse health effects, biofilms cause an estimated $324 billion impact on the global agrifood sector annually. Thus, a better understanding of the characteristic biofilm formation of microbes in the food and food-processing chain is essential for its prevention. The present study was conducted to understand the biofilm-forming ability of *Escherichia coli*, a major foodborne pathogen, isolated from various foods of animal origin (milk, chicken meat and chicken egg) and correlated with the multidrug resistant (MDR) pattern. Moreover, as a biofilm control strategy, probiotics have been tested to minimize biofilm formation by *E. coli*. The use of probiotics can be an alternative approach to reduce the formation of pathogenic biofilms in the food industry. This study evaluated two lactic acid bacterial (LAB) strains, *Lactobacillus rhamnosus* (LR) and *Lactobacillus casei* (LC), against *E. coli* biofilms. Both LAB strains were tested alone and in combination for their antibacterial activity using the agar spot method, anti-biofilm activity, auto-aggregation, and co-aggregation abilities against *E. coli*. First, the antimicrobial resistance patterns and biofilm biomass quantification of 115 *E. coli* isolates from milk (36), chicken meat (33), and eggs (46) were observed using the Kirby Bauer disk diffusion method and crystal violet (CV) assay, respectively. The results revealed that approximately 69.56% of the *E. coli* isolates were resistant to ≥3 antibiotic classes. In the biofilm assay, 24.34% were strong biofilm formers, 31.30% were moderate biofilm formers, and 45.22% were weak biofilm formers. Biofilm-forming genes, such as *fim*C, were positive in 50.43% of isolates, whereas crl was positive in 80.0% of isolates. Moreover, MDR isolates exhibited strong biofilm ability with a higher frequency of *fim*C (55.55%) and crl (85.81%) than non-MDR isolates. On determining LAB strains potential, the L. rhamnosus showed 29.10 mm antibacterial inhibition zone with 102.77% average reduction in biofilm, 59.46% auto-aggregation and 40.61% co-aggregation with *E. coli* isolates whereas the *L. casei* showed 21.80 mm antibacterial inhibition zone with 56.78% average reduction in biofilm growth, 45.23% auto-aggregation and 36.81% mean co-aggregation with *E. coli* isolates. On combination therapy (LR+LC), 87.49% average reduction in biofilm growth and 40.23% mean co-aggregation were observed. These findings suggest that both strains are effective in removing biofilm growth in all food-origin isolates, with L. *rhamnosus* proving to be more effective than L. *casei*. Scanning electron microscopy (SEM) images confirmed the biofilm reduction of *E. coli* isolates by LAB strains. This study demonstrated the effectiveness of probiotic-based strategies in reducing biofilm formation by both multi-drug resistant (MDR) and non-MDR E. coli strains. These findings indicate that implementing these strategies can contribute to improved public health and environmentally sustainable practices. These results underscore the importance of ongoing monitoring and intervention in animal food production to mitigate the risks associated with antibiotic resistance and biofilm formation.

Audience Take Away Notes

- Biofilm formation is a survival mechanism and an adaptation strategy employed by microbes under

adverse environmental conditions. This study highlights how biofilm formation by *E. coli* in various animal-origin foods contributes to the long-term contamination of food and food-contact surfaces.

- Probiotics offer a promising alternative approach to control pathogenic biofilms in the food industry. This study evaluated the effectiveness of two lactic acid bacteria (*Lactobacillus rhamnosus* and *Lactobacillus casei*) in reducing biofilm formation by *E. coli*. The results showed that these probiotics could significantly inhibit biofilm growth and demonstrate antibacterial properties.
- The prevalence of multidrug-resistant (MDR) *E. coli* strains in food samples of animal origin is a cause of concern. This study observed a high percentage of MDR *E. coli* isolates, along with a correlation between MDR and strong biofilm-forming ability. The use of probiotics is effective in reducing biofilm formation, even in MDR strains, highlighting their potential to combat antibiotic resistance in the food industry.
- The present work will directly and indirectly provide insights to the food industry and consumers regarding the challenges and pave the way for further research in this important area.

Biography

Manjeet Sharan is a Veterinary Science graduate from the Indian Veterinary Research Institute, UP, India, with a Master's degree in Veterinary Public Health and Epidemiology from Guru Angad Dev Veterinary and Animal Sciences University, Punjab, India, in 2022. Her research, conducted under the guidance of Dr. Pankaj Dhaka, has focused on developing innovative strategies to combat antimicrobial resistance and biofilms. Dr. Sharan has made notable contributions to the field by publishing two papers, including a scoping review and a research article. Dr. Sharan also presented her research findings at various international and national conferences and seminars, receiving recognition and awards for her work. Her thesis entitled “Studies on biofilms of multidrug resistant *Escherichia coli* and *Staphylococcus aureus* from foods of animal origin and their control strategy” was honoured with the prestigious Best MVSc. Thesis Award in 2022 from IAVPHS (Indian Association of Veterinary Public Health Specialists), showcasing her dedication and excellence in the field of veterinary science.

Javaid Hameed
University of Kashmir, India

Unveiling the potential of cultured lactobacillus and enterococcus probiotic strains isolated from Hangul deer (Cervus Hanglu Hanglu): Implications for health management and conservation

The mammalian gut microbiota plays a crucial role in promoting host health, and lactic acid bacteria (LAB) are commonly employed as probiotics for their beneficial effects. The Hangul deer (Cervus hanglu hanglu), a critically endangered red deer subspecies found in the Indian subcontinent, requires meticulous health management for its conservation. This pioneering study aimed to isolate, identify, and evaluate the in-vitro probiotic functional properties of LAB strains from the feces of Hangul deer. A total of 27 LAB strains were isolated and identified using 16S rDNA gene sequencing, followed by comprehensive probiotic characterization and safety assessment. Remarkably, four species exhibited robust resistance and survivability against varying pH and bile salts, along with high aggregation and co-aggregation capacities. Notably, Lactobacillus acidophilus and Enterococcus mundtii strains displayed antibacterial activities. Safety assessment revealed the absence of hemolytic activity and virulence genes in all four strains. Antibiotic susceptibility testing showed that Lactobacillus acidophilus and Enterococcus casseliflavus were susceptible to all tested antibiotics, while Enterococcus mundtii exhibited resistance to clindamycin, and Enterococcus gallinarum exhibited resistance to erythromycin. These findings suggest that the isolated LAB strains possess advantageous probiotic characteristics and hold potential as dietary supplements for promoting the health and disease management of Hangul deer.

Keywords: Hangul deer, Probiotics, Lactobacillus, Enterococcus.

Biography

Javaid Hameed is a highly motivated and dedicated conservation researcher, currently pursuing a Ph.D. and serving as an Indian Council of Medical Research-Senior Research Fellow at the Centre of Research for Development, University of Kashmir, India. With a M.Sc. degree from Panjab University, Javaid possesses a profound passion for safeguarding our natural resources. His research focuses on investigating the implications of the gut microbiome in the conservation of Red Deer, demonstrating his specialized expertise in this field and Use of probiotics as potential tools for effective protection against pesticide toxicity.

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The potential effect of prebiotics, probiotics, postbiotics, synbiotics, and FMT therapies on COVID-19 induced gut dysbiosis

The COVID-19 pandemic has posed significant challenges to global healthcare systems, with a need for effective therapeutic interventions remaining urgent. Current therapeutic approaches targeting the respiratory system have shown limited success, highlighting the necessity to explore alternative therapies. Emerging evidence suggests that COVID-19 can cause gut dysbiosis through its alteration of microbiota, which may further contribute to the pathogenesis and severity of the disease. In fact, bidirectional communication between the gut and various organs have been observed following COVID-19 infection, and the main organs include the lung, heart, brain, and liver. The studies in this systematic review were extracted from PubMed, Scopus, Web of Science, Embase, and the Cochrane Library and 21 studies were extracted on pro/pre/synbiotics and FMT as potential interventions for COVID-19. The studies involved 2306 patients, including 1209 in the intervention groups and 1097 in the control groups. The studies extracted included 1 study with prebiotics, 4 studies with single-species probiotics, 9 studies with multispecies probiotics, 4 studies with oropharyngeal probiotics, 2 studies with synbiotics and 1 study with FMT. 7 genera of bacteria/fungi were used in the probiotics and synbiotics, namely *Lactobacillus*, *Bifidobacterium*, *Streptococcus*, *Enterococcus*, *Pediococcus*, *Bacillus*, *Saccharomyces* and *Kluyveromyces*. The prebiotics used include quebracho and chestnut tannin, galacto-oligosaccharides, xylooligosaccharide and resistant dextrin. Then, the impact of these interventions on disease severity, gut dysbiosis, and varying COVID associated clinical outcomes was assessed. Most, if not all, of the biotics appeared to have at least one of the following implications: relieve symptoms, reduce inflammation, and reduce mortality. The findings from this review will contribute to the overall understanding of biotics usage as a therapeutic intervention when addressing COVID-19-related gut dysbiosis and secondary, multi-organ complications.

Audience Take Away Notes

- The audience will learn of key changes in COVID-19 induced gut dysbiosis,
- The audience will learn how gut dysbiosis affects the lungs, liver, heart, and brain,
- The audience will also discover the effects of prebiotics, probiotics, synbiotics, postbiotics, and FMT on resolving the gut dysbiosis in COVID-19 patients,
- The audience will learn about current guidelines and future directives about the use of biotics in this field.

Biography

Mahmoud Yousef is a medical student at Weill Cornell Medical College – Qatar. He graduated from high school in 2019 from Qatar International School completing his level. He has worked on several research projects spanning topics including gut microbiota, colorectal cancer, epidemiology of COVID-19, and calcium signaling.

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