IMGC VIRTUAL SYMPOSIUM 2021

IMGC VIRTUAL Symposium 2021 WUR Recorded Sessions

Tuesday, Jun 15 **07:00 AM - 07:15 AM**

Opening Remarks: Milk, a Unique Source of Nutritional, Sustainable, and Functional Proteins

Immunological Properties of Milk | Milk Proteins: Bioavailability and Targets | Milk, Sustainability, & Health | Novel Functions of Milk Bioactives | Invited Speaker

Kasper Hettinga
Associate Professor, Wageningen University & Research

In recent years, dietary advice has pivoted from a single focus on nutritional recommendations to address sustainability of food production and thereby its impact on the planet. In response to embrace sustainability, we are seeing a flurry of recommendations to replace animal protein with plant proteins. Although such a simple message may seem to make sense, it disregards several unique features of milk proteins and in particular their benefit to human health. To address this ongoing debate, the IMGC VIRTUAL Symposium 2021 will focus on "Future Perspectives on Milk Bioactives and Proteins". Milk proteins serve as the single most important ...

Tuesday, Jun 15 **07:20 AM - 07:45 AM**

Human Milk Bioactives: Nutrition and More

Novel Functions of Milk Bioactives | Keynote | L-CERPs (0.5)

Bernd Stahl
Director, R&D of Human Milk Research & Analytical Science, Danone Nutricia Research BV

Kasper Hettinga
Associate Professor, Wageningen University & Research

The first 1000 days after conception are a period of rapid growth and development with specific nutritional requirements. The nutritional influence begins parenterally in utero and is affected by the nutritional status and environment of the mother. After birth, human milk (HM) is the preferred nutrition. The composition of HM is uniquely tailored to an infant's specific demands and is affected by diet, lifestyle, genes and health of mother and child. The WHO recommends exclusive breastfeeding (BF) for the first six months, and continued BF with adequate complementary foods for up to two years and beyond. The development of the ...

Tuesday, Jun 15 **07:50 AM - 08:15 AM**

Antigen Shedding in Human Milk: a Key for Immune System Education?

Immunological Properties of Milk | Invited Speaker | L-CERPs (0.5)

Valerie Verhasselt
Professor, University of Western Australia

Kasper Hettinga
Associate Professor, Wageningen University & Research

In addition of being a source of nutrients for the developing newborn, human milk contains thousands of bioactive compounds, which influence infant health in the short-term as exemplified by its major benefits on infectious disease prevention. Many of the human milk compounds also have the required characteristics to instruct immune development and guide long-term health. Prebiotics, probiotics, varied antimicrobial molecules, all have the potential to shape the composition and function of the establishing gut microbiota, which is known to be a major determinant of proper immune function. Another and less explored way human milk can instruct long-term immunity, is through ...

Tuesday, Jun 15 **08:20 AM - 08:45 AM**

Breastfeeding Promotes Early Neonatal Regulatory T Cell Expansion and Immune Tolerance of Non-Inherited Maternal Antigens

Immunological Properties of Milk | L-CERPs (0.5)

Gergely Toldi
Neonatologist, University of Birmingham

Kasper Hettinga
Associate Professor, Wageningen University & Research

Objectives: Breastfeeding is associated with long-term health benefits, such as a lower incidence of childhood infections, asthma, obesity and autoimmune disorders. However, little is known regarding how the maternal and neonatal immune systems interact after parturition when the neonate receives nutrition from maternal breastmilk. We aimed to analyze how immune phenotype and function evolve between birth and 3 weeks of age in breastfed versus formula fed neonates born by caesarean section. (SCAVENGERHUNTCODE: IMMUNEPHENOTYPE) Methods: We investigated 38 healthy mother and baby pairs in this study. We used flow cytometry to describe the detailed immune phenotype in neonatal and maternal blood ...

Tuesday, Jun 15 **08:50 AM - 09:15 AM**

Extracellular Vesicles in Human Milk can Modulate Innate and Adaptive Immune Responses and Epithelial Barrier Function

Immunological Properties of Milk | Novel Functions of Milk Bioactives | L-CERPs (0.5)

Marca Wauben
Professor, Utrecht University

Kasper Hettinga
Associate Professor, Wageningen University & Research

Objectives: Human milk is nature's first functional food and contains different components playing a role in the development of the infant's gastrointestinal tract and immune system. One of these components are extracellular vesicles (EVs), i.e. cell-derived vesicles used for cell-cell communication. The mode of action of human milk EVs on developmental processes has been poorly studied. In our study we explored the molecular mechanism of milk EV-induced modulation of different cell types present in the oral mucosa. (SCAVENGERHUNTCODE: MECHANISM) Methods: Human milk EVs were purified by differential centrifugation, density gradient floatation and size exclusion chromatography. Effects of milk EVs on ...

Tuesday, Jun 15 **09:20 AM - 09:35 AM**

CD4+ T Cell Modulatory Properties and miRNA Cargo of Human Milk-Derived Extracellular Vesicles are Influenced by Allergic Sensitization of the Mother

Immunological Properties of Milk | L-CERPs (0.25) | Student Award Presentation

Alberta Giovanazzi
PhD student, Utrecht University

Kasper Hettinga
Associate Professor, Wageningen University & Research

Objectives: Human milk supports post-natal immune development of the infant by providing maternal components, including extracellular vesicles (EVs). EVs are cell-derived vesicles used as cell-to-cell vehicles of biological molecules. It has been demonstrated that milk-EVs contain immune-modulatory miRNAs with potential roles in the development of new-born's immunity. (SCAVENGERHUNTCODE: MODULATORY) Furthermore, we showed milk-EVs have CD4+T-cell modulatory properties. Interestingly, allergic diseases can alter the physiological milk composition, however it is still unknown whether EV function and cargo are affected. In this study we investigated whether miRNA cargo and CD4+T-cell modulatory capacity of milk-EVs were different between allergic and non-allergic-lactating women. Methods: ...

Tuesday, Jun 15 **10:00 AM - 11:00 AM**

Breakout Session with the Tuesday Session 1 Speakers

Discuss riveting topics in milk research with speakers and fellow attendees!

Immunological Properties of Milk | Novel Functions of Milk Bioactives | L-CERPs (1.0)

Alberta Giovanazzi
PhD student, Utrecht University

Bernd Stahl
Director, R&D of Human Milk Research & Analytical Science, Danone Nutricia Research BV

Gergely Toldi
Neonatologist, University of Birmingham

Kasper Hettinga
Associate Professor, Wageningen University & Research

Marca Wauben
Professor, Utrecht University

Valerie Verhasselt
Professor, University of Western Australia

Join the morning speakers and fellow attendees to discuss milk bioactives and immunological components that educate, guide and support immune system and gut development.

Tuesday, Jun 15: Exhibit Hall **11:00 AM - 12:00 PM**

Meet-and-Greet Industry Partners in the Exhibit Hall

Exhibit Hall

Get to know our Industry Partners in the Exhibitor Hall each day! They have Scavenger Hunt codes for you to use.

Tuesday, Jun 15 **04:00 PM - 04:25 PM**

The Emergent Immunological Functions of Bovine Milk and its Effects on Human Health

Immunological Properties of Milk | Keynote

Joost van Neerven
Professor, Endowed Chair, Wageningen University & Research and FrieslandCampina

Bruce German
Distinguished Professor, University of California Davis

Breast milk is the first nutrition that mammals provide to their offspring. Milk contains nutrients for growth and development, but is also an important source of components that support immune function. This is of critical importance for protection of newborns, because they do not yet have a fully developed immune system. Even though there are compositional differences between human milk and bovine milk, many components are present in both. Milk components can support development of the immune system, and can affect immune function directly or indirectly via effects on the gastrointestinal microbiota. (SCAVENGERHUNTCODE: MILKCOMPONENTS) Immunologically relevant components include lactoferrin, immunoglobulins, ...

Tuesday, Jun 15 **04:30 PM - 04:55 PM**

Bovine Lactoferrin Stimulates Neonatal Gastrointestinal and Immune Development in Piglets

Immunological Properties of Milk | Novel Functions of Milk Bioactives | Invited Speaker

Sharon Donovan
Professor and Melissa M. Noel Endowed Chair, University of Illinois, Urbana-Champaign

Bruce German
Distinguished Professor, University of California Davis

Objectives: Lactoferrin (LF) is major iron-binding protein in human milk that exerts a wide-range of biological activities within the infant. The objective of this research was to investigate potential mechanisms whereby orally administered bovine lactoferrin (bLF) modulates gastrointestinal and immune development in the preclinical piglet model. (SCAVENGERHUNTCODE: PIGLET2021) Methods: Newborn piglets were fed formula containing 0 (CON), 1 (LF1) or 3.6 (LF3) g/L bLF for 14 days. Fecal bLF and IgA and serum IgG were measured by ELISA. Intestinal morphology, enzyme activity, cellular proliferation, and gene expression were assessed. Immune cells isolated from serum, spleen and mesenteric lymph nodes were ...

Tuesday, Jun 15 **05:00 PM - 05:25 PM**

Towards a More Complete Milk Glycome: Advances in Ion Chromatography-Mass Spectrometry (IC-MS) for Improved Separation and Analysis of Milk Glycans

Novel Functions of Milk Bioactives

Tian Tian
Staff Scientist, Thermo Fisher Scientific

Bruce German
Distinguished Professor, University of California Davis

Glycans form a major component of human milk, occurring both in free form as lactose and oligosaccharides (HMO), and as conjugated to glycoproteins primarily through N- and/or O-linked glycosylation. Glycosylation to milk protein is known to be important for myriad biological processes, such as enabling resistance to proteolytic digestion thereby facilitating the release of encrypted bioactive peptides and promote the growth of gut probiotics. (SCAVENGERHUNTCODE: GLYCOSYLATION) Few tools are currently available to analyze the glycome without derivatization. The objective of this study is to develop a workflow featuring straightforward and IC-friendly sample preparation, and enhanced separation and characterization of milk-derived ...

Tuesday, Jun 15 **05:30 PM - 05:55 PM**

The Vaccine-Elicited Immunoglobulin Profile in Milk after COVID-19 mRNA-Based Vaccination is IgG-Dominant and Lacks Secretory Antibodies

Immunological Properties of Milk L-CERPs (0.5)

Rebecca Powell
Assistant Professor, Icahn School of Medicine at Mount Sinai

Bruce German
Distinguished Professor, University of California Davis

Objectives No COVID-19 vaccines are yet under investigation for use in infants or young children. As such, the passive immunity of the antibodies (Abs) provided through milk from a vaccinated person may be one of the only ways to protect this population until pediatric COVID-19 vaccines are licensed. (SCAVENGERHUNTCODE: PROTECT) Our work examining the milk Ab response after SARS-CoV-2 infection demonstrated that Spike-specific IgA in milk after infection is dominant and highly correlated with a secretory Ab response. Determining if secretory Abs are elicited in milk is critical, as this Ab class is highly stable and resistant to enzymatic degradation ...

Tuesday, Jun 15 **06:00 PM - 06:15 PM**

Breastmilk; a Source of SARS-CoV-2 Specific sIgA Antibodies, Highly Stable after Pasteurization

Immunological Properties of Milk | L-CERPs (0.25) | Student Award Presentation

Eva Kontopodi
PhD student, Wageningen University & Research

Bruce German
Distinguished Professor, University of California Davis

Background: Since the outbreak of COVID-19, many put their hopes in the rapid availability of effective immunizations. Breast milk containing antibodies against SARS-CoV-2 may serve as protection through passive immunization. (SCAVENGERHUNTCODE: PASSIVEIMMUNITY) We aimed to determine the presence and neutralization capacity of SARS-CoV-2 antibodies in breast milk of mothers who recovered from COVID-19. Methods: This prospective case control study included lactating mothers, recovered from (suspected) COVID-19 and healthy controls. We collected serum and breast milk. To assess the presence of SARS-CoV-2 antibodies we used multiple complementary assays, namely ELISA with the SARS-CoV-2 spike protein, receptor binding domain (RBD) and nucleocapsid ...

Tuesday, Jun 15 **06:20 PM - 06:35 PM**

Composing a Molecular Symphony: BIOMILQ's Cell-Cultured Human Milk Hits All the Right Notes

Industry Flash Talk

Leila Strickland

Despite universal consensus that breastmilk is the optimal source of nutrition for the first 6 months of life, exclusive breastfeeding is inaccessible to most babies, and a majority are transitioned at least partially to infant formula within this period. Infant formula supports adequate growth when breastfeeding is not an option, but it is unable to replicate many of the compositional and bioactive properties of breastmilk that support immunological, gastrointestinal, and cognitive development. To improve access to many of these benefits of breastmilk, BIOMILQ is developing a process for production of cell-cultured human milk using human mammary epithelial cells, which are ...

Tuesday, Jun 15 **07:00 PM - 08:00 PM**

Breakout Session with the Tuesday Session 2 Speakers

Discuss riveting topics in milk research with speakers and fellow attendees!

Immunological Properties of Milk | Novel Functions of Milk Bioactives | L-CERPs (1.0)

Eva Kontopodi
PhD student, Wageningen University & Research

Joost van Neerven
Professor, Endowed Chair, Wageningen University & Research and FrieslandCampina

Rebecca Powell
Assistant Professor, Icahn School of Medicine at Mount Sinai

Sharon Donovan
Professor and Melissa M. Noel Endowed Chair, University of Illinois, Urbana-Champaign

Tian Tian
Staff Scientist, Thermo Fisher Scientific

Join the afternoon speakers and fellow attendees to discuss the translation of immunological components from proteins to glycans in milk that support development and offer immune protection against pathogens including SARS-CoV-2.

Tuesday, Jun 15 **08:00 PM - 09:00 PM**

Meet-and-Greet Industry Partners in the Exhibit Hall

Get to know our Industry Partners in the Exhibit Hall each day! They have Scavenger Hunt codes for you to use.

Wednesday, Jun 16 **07:00 AM - 07:25 AM**

Effect of Thermal and Non-Thermal Processing on the Functionality of Bioactive Milk Proteins

Milk Proteins: Bioavailability and Targets | Keynote

Kasper Hettinga
Associate Professor, Wageningen University & Research

Jennifer Smilowitz
Faculty Affiliate, University of California Davis & IMGC

Dairy products receive a lot of attention in relation to their health effects in both science and society. The relation between milk components and human health is, however, very complex. Milk contains numerous components that can have a wide range of physiological effects. The challenge is to understand which milk components are responsible for these physiological effects. As heating of milk changes the functionality of milk, such as its antibacterial capacity, the immune response to milk, heat-sensitive components in milk are underlying several of these beneficial properties of milk. (SCAVENGERHUNTCODE: MILKBENEFITS) It is therefore of interest to explore the effect ...

Wednesday, Jun 16 **07:30 AM - 07:45 AM**

Effect of Heating on Milk Protein Digestion and Clot Formation during in vitro Infant Gastric Digestion

Milk Proteins: Bioavailability and Targets | Student Award Presentation

Julie Miltenburg
PhD Student, Wageningen University & Research

Kasper Hettinga
Associate Professor, Wageningen University & Research

Objective Heating of milk proteins can influence their gastric digestion, both through differences in whey protein hydrolysis and changes in gastric clot formation. When investigating gastric protein hydrolysis, usually only the soluble part is analyzed, whereas information on the clot is not taken into account, leading to an incomplete picture of protein digestion. Therefore, we aimed to study the effect of heating of milk proteins on in vitro infant gastric digestion by analyzing both the soluble and insoluble part. (SCAVENGERHUNTCODE: INVITRO21) Methodology Raw and heated skim milk (80°C, 30 min) was digested using in vitro infant gastric digestion. After digestion, ...

Wednesday, Jun 16 **07:50 AM - 08:15 AM**

Dose-Dependent Molecular Transcriptome Analysis of Milk Lactoferrin Intervention on Neurodevelopment and Cognitive Function of Neonatal Piglets

Milk Proteins: Bioavailability and Targets | Novel Functions of Milk Bioactives

Bing Wang
Professor of Physiology and Nutrition, Charles Sturt University

Kasper Hettinga
Associate Professor, Wageningen University & Research

Lactoferrin (Lf), a sialic acid (Sia)-rich milk glycoprotein, can promote early neurodevelopment and cognition in neonatal piglets. The dose-dependency of Lf intervention, however, remains unknown. The objective of this study was to determine the dose-dependency of Lf on genes associated with neurodevelopment and cognition in neonatal piglets provided a pig milk replacer supplemented with Lf at 155 mg/kg/day (low dose) or 285 mg/kg/day (high dose) from postnatal day 3 to 38. Gene expression profiles associated with neurodevelopment, cognition. and their cognate proteins were quantitatively determined. The following are new findings: (1) The rate of piglet learning and long-term memory was ...

Wednesday, Jun 16 **08:20 AM - 08:35 AM**

Effect of Different κ-Casein Isoforms on the in vitro Digestibility and Peptidomics of Released Peptides

Milk Proteins: Bioavailability and Targets | Student Award Presentation

Bulei Sheng
PhD Student, Aarhus University

Kasper Hettinga
Associate Professor, Wageningen University & Research

Among bovine caseins, only κ-casein (κ-CN) can be glycosylated, which has different genetic variants resulting in amino acid substitutions and varying degree of glycosylation (AA, 46.9%; BB, 50.9%; AB, 50.0%). Besides, the attached glycans represent five different types, of which three include charged sialic acids. Both glycosylation degree and glycan type could influence the digestibility of both whole milk and κ-CN itself, as glycosylation can hinder enzymatic cleavage. Objectives: To investigate the impact of bovine κ-CN genetic variant, glycosylation degree and its sialylation on the in vitro digestibility and peptide release. Methods: The in vitro digestibility investigated by INFOGEST 2.0 ...

Wednesday, Jun 16 **08:40 AM - 08:55 AM**

Dietary Cross-Species Communication: Context-Dependent Role of Bovine Milk-Derived Extracellular Vesicles in Cancer Progression

Novel Functions of Milk Bioactives | Student Award Presentation

Rahul Sanwlani
PhD Student, La Trobe university

Kasper Hettinga
Associate Professor, Wageningen University & Research

Objectives: The idea of cross-kingdom, species and inter-individual transfer of bioactive compounds via extracellular vesicles (EVs) is a recent avenue. However, the bioactivity and bioavailability of these dietary compounds upon consumption is highly debated. It has been proposed that EVs from diet can absorbed by consuming organisms, be bioavailable in various organs and exert phenotypic changes. (SCAVENGERHUNTCODE: EV2021) Milk is the most vastly consumed beverage and is an abundant source of EVs that may act as signalosomes. Whether these milk-derived EVs can serve as cross-species messengers and have a biological effect on host organism has been poorly understood. Methods: Bovine ...

Wednesday, Jun 16 **09:00 AM - 10:00 AM**

Breakout Session with the Wednesday Session 1 Speakers

Discuss riveting topics in milk research with speakers and fellow attendees!

Milk Proteins: Bioavailability and Targets | Novel Functions of Milk Bioactives

Bing Wang
Professor of Physiology and Nutrition, Charles Sturt University

Bulei Sheng
PhD Student, Aarhus University

Julie Miltenburg
PhD Student, Wageningen University & Research

Kasper Hettinga
Associate Professor, Wageningen University & Research

Rahul Sanwlani
PhD Student, La Trobe university

Join the morning speakers and fellow attendees to discuss novel approaches that reveal unique functions and impact of milk from cognition to protection against cancer progression.

Wednesday, Jun 16 **10:00 AM - 11:00 AM**

Meet-and-Greet Industry Partners in the Exhibit Hall

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Wednesday, Jun 16 **04:00 PM - 04:25 PM**

Decreasing the Environmental Footprint of our Diet – a Modelling Approach Using Optimeal®

Milk, Sustainability, & Health | Keynote

Stephan Peters
Nutrition Science Manager, Dutch Dairy Association (NZO)

Bruce German
Distinguished Professor, University of California Davis

Replacing animal-based foods with plant-based foods does not necessarily lower the diet's carbon footprint. Sometimes replacing certain foods leads to counter-intuitive results, because a switch of a few food items can affect nutritional value and the carbon footprint significantly. In addition, a healthy and sustainable diet should also be cultural and economic acceptable for consumers. Altogether, this makes composing a sustainable diet a delicate balance between these factors. Modeling with the quadratic programming tool, developed in the Netherlands, Optimeal® helps to understand the impact of changing food choices on health, ecological impact and food prizes. The results show that the ...

Wednesday, Jun 16 **04:30 PM - 04:56 PM**

The Two Protein Transitions: Plant Proteins Versus Dairy

Milk, Sustainability, & Health | Invited Speaker

Adam Drewnowski
Professor, University of Washington

Bruce German
Distinguished Professor, University of California Davis

The term nutrition transition refers to incomes-driven shift from traditional diets of starchy staples to diets with more animal foods, added sugar, and fat. The term "protein transition" refers to the associated dietary shifts between plant and animal proteins. Two opposing protein transitions are currently taking place. (SCAVENGERHUNTCODE: PROTEINTRANSITION) Poor countries are turning away from plants to more animal products including dairy, eggs and meat in order to improve the quality of their diets. Rich countries propose to replace dairy, eggs and meat with plant-based foods, also in order to improve the quality of their diets. The plant-based EAT-Lancet diet ...

Wednesday, Jun 16 **05:00 PM - 05:25 PM**

Bifidobacteria-Mediated Immune System Imprinting in Early Infancy

Immunological Properties of Milk

Bethany Henrick
Director of Immunology & Diagnostics, Evolve BioSystems Inc.

Bruce German
Distinguished Professor, University of California Davis

Immune-microbe interactions early in life influence the risk of allergies, asthma and other inflammatory diseases. Breastfeeding guides healthier immune-microbe relationships by providing nutrients to specialized microbes that in turn benefit the host's immune system. (SCAVENGERHUNTCODE: SPECIALIZED) Such specialized bacteria have co-evolved with humans and human milk components but are now increasingly rare in modern societies. Here we show that a lack of bifidobacteria, and in particular depletion of genes required for human milk oligosaccharide (HMO) utilization from the metagenome, is associated with systemic inflammation and immune dysregulation early in life. In breastfed infants given Bifidobacterium infantis EVC001, which expresses all ...

Wednesday, Jun 16 **05:30 PM - 05:55 PM**

Development of a Bio-Guided Process to Isolate Antimicrobial Peptides from Dairy Streams

Milk Proteins: Bioavailability and Targets | Milk, Sustainability, & Health

Bruna Paviani
Researcher, University of California Davis

Objectives: Natural bioactive compounds like milk-derived antimicrobial peptides with multifunctional properties are emerging as promising alternatives to conventional antibiotics. Our group previously demonstrated that whey permeate, obtained after protein isolation, is a source of these valuable peptides - despite having been managed as a waste thus far. This work aimed to develop a pilot-scale process to isolate naturally occurring antimicrobial peptides from dairy streams (using whey permeate sourced from colostrum as a model system) and to perform an initial evaluation of these peptides' antimicrobial properties. Methods: Naturally occurring peptides from colostrum whey permeate were isolated through the optimization of an ...

Wednesday, Jun 16 **06:00 PM - 06:25 PM**

Digestive Survival of Human and Bovine Milk Proteins and Release of Antimicrobial and Immunomodulatory Milk Peptides

Immunological Properties of Milk | Milk Proteins: Bioavailability and Targets | L-CERPs (0.5)

Outstanding Early Career Investigator Award

David Dallas
Assistant Professor, Oregon State University

Bruce German
Distinguished Professor, University of California Davis

Background: Milk proteins have evolved to benefit the suckling neonate. The extent to which most of these proteins survive within the infant (for human milk) and adult (for bovine milk) remains mostly unknown, and thus their bioactive potential is unclear. For many milk proteins, partial digestion releases fragments—peptides—with known antimicrobial, prebiotic, immune-modulating, calcium-delivery, antihypertensive, and pain-modulating activities. The extent to which these peptides survive within the digestive tract need to be further examined to determine their biological relevance. Our objective is to determine the survival of milk proteins and release of bioactive peptides in the intestine of human infants (human ...

Wednesday, Jun 16 **06:30 PM - 06:45 PM**

Breastfeeding Support as a Human Universal

L-CERPs (0.25) | Most Valuable Presentation 2020

Katie Hinde
Associate Professor, Arizona State University

Jennifer Smilowitz
Faculty Affiliate, University of California Davis & IMGC

As 21st Century scientists decode the exceptional properties of human milk for human babies, sustained messaging to "normalize breastfeeding" aims to remedy the declines in breastfeeding in the 20th Century. (SCAVENGERHUNTCODE: NORMALIZE) Re-evaluating our understanding of human breastfeeding reveals that the difficulties experienced by women in industrialized settings, such difficulty with latch, pain, and perceived milk insufficiency are experienced by women in traditional settings and are addressed by culturally embedded and sustained lactation support during the perinatal and post-natal period. The breastfeeding support roles were, and in some cultures remain, most typically filled by female relatives, but are increasingly filled ...

Wednesday, Jun 16 **06:50 PM - 07:00 PM**

Closing remarks: From Discovery to Practice

Immunological Properties of Milk | Milk Proteins: Bioavailability and Targets | Milk, Sustainability, & Health | Novel Functions of Milk Bioactives | Invited Speaker

Bruce German
Distinguished Professor, University of California Davis

Jennifer Smilowitz
Director of Scientific and Strategic Development, IMGC

Get together with Dr. German and Dr. Smilowitz as they summarize the highlights from symposium's sessions and discuss upcoming events hosted by the IMGC on lactation and milk science. (SCAVENGERHUNTCODE: TRANSLATION2021)

Wednesday, Jun 16 **07:00 PM - 08:00 PM**

Breakout Session with the Wednesday Session 2 Speakers

Discuss riveting topics in milk research with speakers and fellow attendees!

Milk Proteins: Bioavailability and Targets | Milk, Sustainability, & Health

Adam Drewnowski
Professor, University of Washington

Bethany Henrick
Director of Immunology & Diagnostics, Evolve BioSystems Inc.

Bruna Paviani
Researcher, University of California Davis

David Dallas
Assistant Professor, Oregon State University

Katie Hinde
Associate Professor, Arizona State University

Stephan Peters
Nutrition Science Manager, Dutch Dairy Association (NZO)

Join the afternoon speakers and fellow attendees to end the symposium with rivetting discussions around lactation and milk for a healthier and sustainable planet. Discussions will be centered around novel approaches that extract added value from waste-streams, importance of protein quality when designing diets and the need for universal breastfeeding support for all mother-infant dyads to support life-long health.

Wednesday, Jun 16 **08:00 PM - 09:00 PM**

Meet-and-Greet Industry Partners in the Exhibit Hall