



APPLIED HOLOGENOMICS CONFERENCE

Bilbao, Spain 13th-15th September 2022



A HoloFood
conference

HoloFood
Hologenomics for sustainable food production

Local organiser:



Universidad
del País Vasco

Euskal Herriko
Unibertsitatea

Conference Venue: Palacio Euskalduna, Bilbao

Version 12-Sept-2022

13th of September 2022

12pm Registration Opens

14:00-14:30 Conference Opening

14:30-16:45 Session 1: Introductory and Keynote Sessions

17:00 - 20:00 Poster Session with local pintxos and wine reception

14th of September 2022

07:30-08:15 Morning run

09:00-11:00 Session 2: Human Health

11:30-18:15 Session 3: Agriculture, Aquaculture and Food Production

17:00-23:00 Conference Social Tour & Dinner

15th of September 2022

09:00-10:45 Session 4: Biodiversity and conservation

11:15-12:30 Session 5: Technical & Methodological Perspectives

13:15-14:15 Session 6: The Industry/Academia Partnership

14:20- 15:00 Session 7: Student Poster award & Closing talks

Scan here to ask
questions!

Ask a question!



Slido: #AHC2022

@AppliedHoloConf



#AHC2022

See the
conference
abstracts here!



www.appliedhologenomicsconference.eu



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 817729

Tuesday 13th of September 2022

12pm Registration Opens Coffee and welcome



14:00 Conference Opening

Ask a question!



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14:00 Welcome by local organisers Dr. Melanie Parejo and Dr. Iratxe Zarrakonaindia
(University of the Basque Country EHU/UPV, Spain)

14:10 Welcome by HoloFood coordinator Prof. Tom Gilbert
(University of Copenhagen, Denmark)

14:20 Welcome by Research Vice Director of the University of the Basque Country Dra.
Inmaculada Arostegui

Session 1: Introductory and Keynote Sessions

14:30 The extended human hologenome, the next hundred years
Prof. Rob Dunn, NC State University, USA

15:00 A Symbiotic Dialogue

Discussion hosted by moderator Assoc. Prof. Antton Alberdi (UCPH, DK) with Prof. Seth Bordenstein
(Penn State University, USA) & Senior Scientist Henna-Maria Kailanto (IFF Health, Finland)

16:00 Multi-omics techniques applied to investigate the global human microbiome
Assist. Prof. Mathilde Poyet (University of Kiel, Germany)



16:45 Group Photograph

17:00 - 20:00 Poster Session with local pintxos and wine reception

Please note - attendees with posters are split in the following groups and are asked to stand by their posters during the following time points

17:15-18:00

Group 1: Posters with numbers 1-28

18:00-18:45

Group 2: Posters with numbers 29-46

18:45-19:30

Group 3: Posters with numbers 47-65



07:30-08:15 Exercise your holobiont! Morning run and see the local sights!

Various paces available. Total distance 5.1km
Meeting & end point: front of conference venue



Session 2 Human Health

Moderated by Prof. Tom Gilbert (UCPH, DK)

Ask a question!



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09:00 Food for thought: hologenomic adaptations to amylose and lactose in the evolving human diet

Assoc.Prof. Christina Warinner Harvard University USA, MPI Germany

09:25 Evolution and function of host-microbiome systems

Assistant Prof. Mathieu Groussin, University of Kiel, Germany

09:50 The gut microbiota and mental disease – approaching a hologenomics view

Prof. Karsten Kristiansen, University of Copenhagen, Denmark

10:15 Distinctive Streptococcus clades characterise oral niches regardless of industrialisation status and oral pathology

Irina M. Velsco, Max Planck Institute for Evolutionary Anthropology, Germany

10:30 Why are there different microbial community types?

Karoline Faust, KU Leuven, Belgium

10:45 Ancient oral microbiome reveals gradual adaptation of Italian prehistoric communities to Neolithic dietary shifts towards agriculture

Andrea Quagliariello, University of Padua, Italy

11:00-11:30 Coffee Break



Session 3: Agriculture, Aquaculture and Food Production

Moderated by Associate Professor Morten Limborg (UCPH, Denmark) and Research Associate Dr Iratxe Zarraonaindia (UPV/EHU, Spain)

Ask a question!



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11:30 Research and Innovation for microbiomes

Magdalena Gajdzinska, Directorate General for Research and Innovation of the European Commission, Brussels

11:55 Engineering algal microbiomes for sustainable food and feed production

Professor Lone Gram, DTU, Denmark

12:20 Leveraging microbiota services through hologenomic analyses to improve gut health in farmed salmon

Jaelle C. Brealey NTNU, Norway

12:35 A hologenomic approach to the management of infectious diseases affecting the American oyster, *Crassostrea virginica*

Marta Gomez-Chiarri, University of Rhode Island, USA

12:50 Microbiota-mediated protection against *Flavobacterium* infection in gnotobiotic zebrafish

Rebecca J. Stevick and David Pérez Pascua, Institute Pasteur, France

13:15-14:15 Lunch Break

14:15 What if the unit of selection in breeding is the holobiont instead of the plant?

Assistant Researcher Dr Amaia Nogales, ISA, Universidade de Lisboa, Portugal

14:40 Plant microbes and bacteriophages; the smallest, most abundant entities of plant microbiomes

Prof. Lars Hestbjerg, University of Copenhagen, Denmark

15:05 Potential drivers of plasticity and persistence of the gut microbiome

Prof. Itzik Mizrahi Ben-Gurion University of the Negev, Israel

15:30 Copy number variation on ABCC2-DNMBP loci impacts the diversity and functions of the gut microbiota in pigs

Yulixaxis Ramayo Caldas, Institute of Agrifood Research and Technology, Spain

15:45 Elucidating host genetic effects on the microbiota using zebrafish and CRISPR/Cas- a hologenomic approach

Eiríkur Andri Thormar, University of Copenhagen, Denmark

16:00 Supplemented diets with quercetin and epicatechin enhance the growth performance of *Totoaba macdonaldi* related to the improvement of gut microbiota metagenomic analysis and liver transcriptome: a hologenomic approach

María Fernanda Barragán-Longoria, ITESM, Mexico

Session ends 16:15.

17:00 Social Evening - Tour and dinner - Pick up at 17:00pm in front of conference venue. Return to Bilbao approximately 11pm



Session 4: Biodiversity and conservation

Moderated by Prof. Mike Martin (NTNU, Norway)

Ask a question!



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09:00 Global hologenomics to reveal the impact of wild animal-microbiota interactions on ecological and evolutionary processes

Dr. Aoife Leonard, University of Copenhagen, Denmark

09:25 Metagenomic shifts in mucus, tissue and skeleton of the coral *Balanophyllia europaea* living along a natural CO₂ gradient

Research Fellow Giorgia Palladino, University of Bologna, Italy

09:50 The gut microbiota affects the social network of honeybees

Prof. Philipp Engel, University of Lausanne, Switzerland

10:15 Host-microbiota responses to a series of perturbations in two case-studies

Adam Koziol, University of Copenhagen, Denmark

10:30 Hologenomic analysis of hundreds of herbarium specimens reveals the genomic basis of a plant invasion

Dr Vanessa Bieker, NTNU, Norway

Coffee Break 10:45 – 11:15



Session 5: Technical & Methodological Perspectives

Moderated by Lorna Richardson (EMBL-EBI, UK)

11:15 Network analysis of host-microbiome omics data

Prof. Torgeir Hvidsten, NMBU, Norway

11:35 Connecting structure and function from organs to molecules in host-microbe interaction

Dr Manuel Liebeke- Max Planck Institute for Marine Microbiology, Germany

11:55 New data, same challenges: Case study of DNA-methylation associated with tenacibaculosis and microbiome composition in Atlantic Salmon (*salmo salar*)

Søren Blikdal Hansen University of Copenhagen, Denmark

12:10 A Microbial Genome Atlas enables novel insights into bacteria-host interactions via functional mapping

Arturo Vera-Ponce de León, NMBU, Norway

12:30-13:15 Lunch



Session 6: Holo-omics and the Industry/Academia Partnership

Round table moderated by Ana R. Verissimo (UCPH, Denmark)

13:15-14:15 Round table panel discussion on the industry - academia partnership

with Harald Sveier (Lerøy, Norway), Itziar Tueros (ATZI, Spain), Magdalena Gajdzinska (Directorate General for Research and Innovation of the European Commission, Brussels), Rob Dunn (NC State University, USA)

Ask a question!



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Session 7: Closing ceremony and poster award

14:20 Concluding Remarks by Prof. Seth Bordenstein (Penn State University, USA)

14:45 Student poster award and closing of the conference

Prof. Tom Gilbert and Associate Prof. Morten Limborg (University of Copenhagen, Denmark)

15:00 Conference ends – thank you for joining us!

Posters



Posters associated with this Session 2: Human Health

Poster #21 Paleofeces reveal recent loss of diversity and microbial symbionts in the Western gut microbiome

ALEXANDER HÜBNER, MPI, Germany

Poster #28 The Parasite microbiome: a novel resource for therapeutic and diagnostic development

DHEILLY NOLWENN, UMR, France

Poster #48 Gut-on-a-chip in vitro models for a more accurate understanding of the action of probiotics in human health

OSTAIZKA AIZPURUA, UCPH, Denmark

Poster #57 Bidirectional causality between gut microbiota and HLA DQ2 celiac patients: a Two-sample Mendelian Randomization approach

BÁRBARA GONZÁLEZ GARCÍA, UPV/EHU, Spain



Posters associated with Session 3: Agriculture, Aquaculture and Food production

Poster #4 Impact of feed additives and host-related factors on bacterial metabolic activity, and immunological traits in the ileum of broilers

YADA DUANGNUMSAWANG, Freie Universität Berlin, Germany

Poster #5 Impact of feed additives and host-related factors on bacterial metabolic activity, and immunological traits in the caecum of broilers

YADA DUANGNUMSAWANG, Freie Universität Berlin, Germany

Poster #7 Comparative analysis of metagenomics and metataxonomics for the characterization of vermicompost microbiomes

KEITH A. CRANDALL, George Washington University, USA

Poster #9 A data-driven selection scheme of nutritionally beneficial bacteria for marine aquaculture fish

KONSTANTINOS KORMAS, University of Thessaly, Greece

Poster #12 Recovering ancient fermented beverages from trans-Himalayan trade routes along the Tibetan plateau

MAXIME BORRY, MPI, Germany

Poster #19 Microbiome composition and distribution of major endosymbionts in Scaphoideus titanus Ball, 1932 across northern Italy.

JUAN SEBASTIAN ENCISO, The Free University of Bozen-Bolzano, Italy

Poster #22 Specific microbial fingerprints are associated with low levels of LT toxin-carrying enterotoxigenic Escherichia coli in the gut

ALESSANDRA TANCREDI, Gent University, Belgium



Posters associated with Session 3: Agriculture, Aquaculture and Food production #2

Poster #23 Engineering microbiomes to improve insect production and performance

ASMUS TOFTKÆR MUURMANN, Aalborg University, Denmark

Poster #29 Role of the microbiota in alimentary tick-borne encephalitis virus infection

DHEILLY NOLWENN, Anses UMR Virology, France

Poster #30 Large intestine Caco2-cell adhesion of probiotic microbiota when exposed to spice/herb extracts and Thai curry under in-vitro digestion model

JUTAMAT KLINSODA, Kasetsart University, Thailand

Poster #31 Temporal development of the intestinal microbiota and tissue gene expression in broiler chickens

SOFIA MARCOS, University of the Basque Country, Spain

Poster #39 Koji-based fermented foods as a model system for understanding fungal-bacteria interactions and their potential effects on host-associated metabolism

TIFFANY MAK, DTU BioSustain, Denmark

Poster #41 Improving the characterisation of the chicken gut microbiome: a multi-kingdom genomic approach

GERMANA BALDI, VARSHA KALE, EMBL-EBI, UK

Poster #42 A paired metagenomic and metatranscriptomic analysis of the salmon gut microbiome to assess the performance of sustainable feed additives

VARSHA KALE, GERMANA BALDI, EMBL-EBI, UK

Poster #43 Berberrubine, a berberine-derived metabolite, is produced by the gut microbiota and improves gut health

TESSA DEHAU, Ghent University, Belgium

Poster #45 Microbiome of pigs treated with different antimicrobials during an outbreak of post-weaning diarrhoea

JUDITH GUITART-MATAS, INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTÀRIES (IRTA), Spain

Poster #46 Viromes of Atlantic salmon correlate with gut microbiota and disease infection status – potential for modulating microbiome dysbiosis

CAROLINE SOPHIE WOLTERS PETERSEN, University of Copenhagen, Denmark

Poster #47 HOLO-OMICS ELUCIDATE COEVOLUTION OF HOST-MICROBIOTA IN SALMONIDS

JACOB AGERBO RASMUSSEN, University of Copenhagen, Denmark

Poster #51 Interactions between the probiont *Phaeobacter inhibens* S4, the marine pathogen *Vibrio coralliilyticus* RE22, and the holobiont of larval American oysters, *Crassostrea virginica*

JESSICA COPPERSMITH, University of Rhode Island, USA

Poster #55 Unlocking aggressive animal behaviour using metatranscriptomics

LUISA SANTOS-BAY, University of Copenhagen, Denmark



Posters associated with Session 3 #3

Poster #56 The HoloFood Data Portal

ALEXANDER (SANDY) ROGERS, EMBL-EBI, UK

Poster #58 Dynamics of the Top Biome of cereal leaf beetle (*Oulema melanopus*) is influenced by the diet and developmental stage.

BEATA WIELKOPOLAN, Institute of Plant Protection, Poland

Poster #60 Revisiting in the ecological origins of bacteria in our fermented foods

VERONICA M. SINOTTE, University of Copenhagen, Denmark

Poster #61 *Saccharomyces cerevisiae* on the rise: Domestication of yeast in breadmaking

MARGOT RUFFIEUX, North Carolina State University, USA

Poster #62 Social bee microbiomes are the missing link in the origin of human fermented foods

ANA CUESTA-MATÉ, University of Copenhagen, Denmark

Poster #63 Molecular mechanisms of microbiota-mediated protection against *Flavobacterium* infection in gnotobiotic zebrafish

DAVID PÉREZ PASCUAL, Institute Pasteur, France

Poster of #64 In vitro model to study synbiotic-pathogen-gut microbiota interactions at microscale

ANDI EREGA, ETH Zürich, Switzerland



Posters associated with Session 4: Biodiversity and conservation

Poster #15 Origin and acquisition of rhizosphere microbes in antarctic vascular plants

EDUARDO CASTRO-NALLAR, Universidad de Talca, Chile

Poster #34 Feed-microbiome-host interactions in Atlantic salmon over life stages

SHASHANK GUPTA, NMBU, Norway

Poster #38 Experimental warming and cooling shapes host microbiota composition

JINGDI LI, University of Oxford, UK

Poster #40 Exploring the pet gut microbiome within a large-scale investigation of animal gut metagenomes

ANA CUSCO, Fudan University, China

Poster #44 Hologenomic Adaptation of European Whitefish

MENG ZHAO, University of Copenhagen, Denmark



Posters associated with Session 5: Methodological Breakthroughs

Poster #1 Improving accessibility to ancient microbiome data beyond palaeogenomics

JAMES A. FELLOWS YATES, LEIBNIZ INSTITUTE FOR NATURAL PRODUCT RESEARCH AND INFECTION BIOLOGY & MPI, Germany

Poster #6 Evaluation of computational methods for human microbiome analysis using simulated data

MATTHIEU J. MIOSSEC/MARCOS PÉREZ-LOSADA, George Washington University, USA

Poster #10 microbetag: a microbial co-occurrence network annotator

HARIS ZAFEIROPOULOS, KU Leuven, Belgium

Poster #13 Can shallow shotgun-based profiling of the gut microbiome improve the detection of host genetic effects?

FELIPE MORILLO SANZ DIAS, Center for Genomic Regulation, Spain

Poster #37 Recovering High-Quality Host Genomes from Gut Metagenomic Data through Genotype Imputation

SOFIA MARCOS, University of the Basque Country, Spain

Poster #49 Reference-agnostic estimation of microbial read abundance in holobionts

RAPHAEL EISENHOFER, University of Copenhagen, Denmark
