PRBB building, Dr. Aiguader , 88, 08003 - entrance through Dr. Aiguader Street, **Marie Curie Room**. Google Map

Wednesday, 25th September 2024

9.30h to 16.40h (CET) meeting

9.30-10.00 Opening Remarks by Léa Maitre, Symposium Chair. Overview of the symposium's goals, schedule, and the importance of exposome research.

Introduction to the Local and Global Exposome Research Landscape by Martine Vrijheid, ISGlobal. Discussion on the current state of exposome research, including international projects like IHEN, and key local initiatives.

10.00-10.30 Keynote 1: *Advances in Measuring Environmental Exposures in Biological Samples and Their Epidemiological Implications*. Montse Marquès Bueno, Universitat Rovira i Virgili. Chair: Pablo Gago-Ferrero - CSIC - Institute of Environmental Assessment and Water Research; co-chair Emily Laveriano, ISGlobal.

10.30-11.10 **Oral presentations - Technological Innovations and Methodologies in Exposomics**

(10min presentation + 2min Q/A)

Selected talks

- *Evaluating Long-Term Exposure to Endocrine Disruptors: A Comparative Study of Hair, Blood, and Urine Samples*. Ana González-Ruiz, IISPV.

- *Metabolomic biomarkers for dietary fibre exposure: summary from human studies*. Andrea Unión Caballero, UB.

- *Exploring the Chemical Exposome in Brain Cancer: A Proof of Concept*. Daniel Gutiérrez Martín, IDAEA-CSIC.

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11.10-11.45 *Coffee break – poster session*

11.45-12.25 **Oral presentations (continued)**

- *Assessment of potentially hazardous chemicals during pregnancy*. Esteban Restrepo-Montes, CID-CSIC.

- *Exposome in Nutrition and Personalized Medicine. Multi-targeted quantitative platform for exposome-based metabolomics*. Meryl Cruz, UB.

- *Pregnant and lactating women facing climate emergency in Barcelona: an anthropological approach to the environment and perinatal health*. Anna Molas and Ana Cerezuela, AFIN-UAB.

12.25-13.00 **Flash talks – 5 min. each – Chair: Karim Lekadir, University of Barcelona - Department of Mathematics and Computer Science; co-chair: Donato Romano, University of Bari/ISGlobal**

Selected talks

- *Impact of fatty acid patterns on adolescent neurocognitive function: Insights from neuropsychological assessments.* Nicolas Ayala Aldana, ISGlobal.

- *Simultaneous determination of neonicotinoid, carbamate/thiocarbamate, triazole, organophosphate and pyrethroid pesticides and their metabolites in urine from general population.* Joan Grimalt, IDAEA-CSIC.

- *Advanced analytics in pediatric exposomics: Decoding the chemical exposome through machine learning.* Mahsa Naghavi Sheikholeslami, IISPV.

- *Green space exposure and blood DNA methylation at birth and in childhood – A multi-cohort study.* Sofía Aguilar Lacasaña, ISGlobal.

- *HYPIEND Digital Tool: A Personalised Platform for Reducing EDC exposure.* Laura Sistach, Eurecat.

13.00-14.15 *Lunch / networking - poster session (presenters should be by their posters 13.45 to 14.15)*

14.15-14.45 **Keynote 2: *The Barcelona Brain Health Initiative (BBHI) - A Cohort Study to Define and Promote Determinants of Brain Health*. Javier Solana Sánchez, Institut Guttmann. Chair: Cristina Andres-Lacueva - University of Barcelona - Biomarkers & Nutritional and Food Metabolomics Group; co-chair Mariona Bustamante, ISGlobal.**

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14.45 -16.15 **Oral presentations - Exposome, Human Health and biological mechanisms**

(10min presentation + 2min Q/A)

Selected talks

- *The early life physical and social external exposome and child selective attention: a multi-cohort study*. Carmen Peuters and Núria Botella, ISGlobal.

- *Prenatal nut and fish intake and neuropsychological function trajectories from birth to 15 years of age: a population-based cohort study*. Ariadna Pinar Martí, ISGlobal.

- *Prenatal exposure to mixtures of endocrine-disrupting chemicals in association with obesity in childhood and adolescence*. Nuria Güil-Oumrait, ISGlobal.

- *Early life environmental exposure and childhood morbidity in Southern Mozambique: An exposome approach*. Stefan Sieber, ISGlobal.

- *Placental epigenome-wide association study of in utero exposure to phthalates*. Hana Vespalcova, ISGlobal.

- *Common genetic variants associated with urinary phthalate levels in children: A genome-wide study*. Mariona Bustamante, ISGlobal.

- *Impact of Maternal Dietary Exposure on Plasma Metabolome, Gut Microbiota, and Immunological Development in Rat Offspring During Pregnancy and Breastfeeding*. Rafael Tume Peralta, UB.

16.15-16.30 Guest speaker: Ville Pimenoff - Associate Professor in Oulu University, Finland. *Personalized metagenome monitoring of exposure for pregnant women*.

16.30-16.40 Closing remarks – End of the event

Poster sessions

- *Advanced suspect screening approach to unveil children's personal chemical exposome using silicone wristbands*. Camilla Guerrini, IISPV.

- *Environmental Contaminant Exposure in Children: A Study of Urine Samples*. Julen Segura Abarrategui. CID-CSIC.

- *Quantification of Tire Rubber Additives and Transformation Products in Silicone Bands and Urine: A Focus on Exposure Assessment*. Francesca De Angelis, CID-CSIC.

- *Novel sample treatment strategies for a holistic chemical exposome characterisation through LC-HRMS*. Ruben Gil-Solsona, IDAEA-CSIC.

- *Characterization of human and environmental exposures to Tire Rubber Additives and their Transformation Products*. Mercè Garí, IDAEA-CSIC.

- *Longitudinal cardiometabolic diseases risk prediction: A deep learning approach with LSTM models*. Marina Camacho, UB.

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- *OnBREATHE: personal air quality monitoring & data digitalization to track chronic respiratory diseases*. Dídac Roda Pitarg, IISPV.

- *Exploring potential exposure-disease associations through air particulate matter analysis, wastewater based epidemiology, and characterization of brain tumors' chemical exposome*. Maria-Christina Nika, IDAEA-CSIC.

- *Brain Perfusion Changes from High Ultra-Processed Food Consumption Mediate Depression*. Adam Alvarez-Monell, UAB.

- *Understanding and preventing the impact of endocrine disruptors in sensitive populations*. Chiara Baudracco, Eurecat.

- *Exploring the Impact of Air Pollutants and Socioeconomic Factors on Respiratory Cancer Mortality in Italy: Insights from Explainable Machine Learning Models*. Donato Romano, University of Bari/ISGlobal.

- *Modeling the Initiation of Lung Neuroendocrine Cancers by Directing Environmental Cues in CRISPR engineered Pulmonary Organoids*. Andrés Marco Giménez, EMBL.

- *The effect of night shift work on microbiome composition*. Raquel Galán, ISGlobal.

- *Assessment of Dermal Migration of Plastic Additives from Consumer Products*. Sandra Callejas-Martos, CID-CSIC.

- *A pilot study: developing an ultra-processed diet for rats and future mechanistic investigations*. Veronica Palomera-Avalos, UAB.

Keynote speakers

Montse Marquès Bueno, Universitat Rovira i Virgili.

Advances in Measuring Environmental Exposures in Biological Samples and Their Epidemiological Implications

The accurate measurement of environmental exposures in biological samples is critical for understanding the complex relationships between environment and health. Environmental exposures have traditionally been measured by means of targeted approaches, which involve the precise quantification of known environmental contaminants in biological samples. Utilizing techniques such as low-resolution mass spectrometry (LRMS), targeted analysis provides high sensitivity and specificity, allowing for the detection of low levels of specific chemicals. In contrast, untargeted methods aim to profile a broad spectrum of unknown and known compounds simultaneously. Techniques such as high-resolution mass spectrometry (HRMS) enable the comprehensive analysis of xenobiotics and metabolites, providing a global snapshot of the chemical exposome. Besides saving time and preserving the amount of biological sample, this approach is particularly useful for hypothesis-generating studies, as it can uncover novel exposure biomarkers and pathways that were not previously considered.

The integration of targeted and untargeted approaches, along with epidemiology, enhances our ability to elucidate the multifaceted interactions between environmental exposures and health outcomes. By combining these methodologies, we can validate novel biomarkers discovered through untargeted screening using targeted quantification, thereby strengthening the causal inference in epidemiological studies.

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This keynote talk will introduce and compare the different approaches for measuring the environmental exposures, highlighting the last advancements in LRMS and HRMS, showcase their application in epidemiological research, and provide concrete examples from the research carried out by my group at IDAEA-CSIC. By bridging the gap between environmental exposure assessment and epidemiology, we can better understand and mitigate the health impacts of environmental contaminants.

Biography

Dr. Montse Marquès is an expert in biomonitoring, exposure science, and the investigation of adverse health outcomes. With over 12 years of experience, Dr. Marquès has significantly advanced the understanding of the complex interactions between environmental exposures and human health. She currently holds the position of Ramón y Cajal Fellow at the Institute of Environmental Diagnostic and Water Research within the Spanish National Research Council (IDAEA-CSIC).

Dr. Marquès earned her Ph.D. in Environmental Toxicology and Chemistry from Universitat Rovira i Virgili (Spain), where she developed targeted approaches for measuring pollutants in environmental and biological samples. During her tenure as a Marie Curie postdoctoral researcher, she combined high-resolution mass spectrometry with exposome-wide association studies at Antwerp University (Belgium) and Columbia University (United States). Her current research focuses on combining omics science with novel epidemiological models, with a special emphasis on women's health.

Her research has been widely published in top-tier scientific journals. She is the PI of the INSULIN mother-child cohort from Hospital Joan XXIII (Tarragona). As a dedicated educator and mentor, Dr. Marquès has served as a lecturer in Environmental Toxicology and Food Toxicology at Universitat Rovira i Virgili for the past six years and is committed to training the next generation of scientists in the field. Additionally, she currently serves as an Associate Editor for two scientific journals (Environmental Pollution and Environmental Advances).

Javier Solana Sánchez, Institut Guttmann.

The Barcelona Brain Health Initiative (BBHI) - A Cohort Study to Define and Promote Determinants of Brain Health.

A graduate in Telematics Engineering and a graduate in Telecommunications Engineering, he holds a master's degree in Telemedicine and Bioengineering, and a PhD in Biomedical Engineering. His expertise is focused on research and innovation in the field of neuroscience, with special interest in the application of technology to improve health services.

During his career, Dr. Solana has participated in more than 18 national and European research projects, many of them focused on innovation and entrepreneurship. For example, he has worked on the development of a mobileHealth coaching solution to monitor and promote healthy habits, as well as on the design of data management systems to optimise brain resilience and recovery after neurological injuries.

He joined the Institut Guttmann's Research, Innovation and Teaching Office in 2016 as the technology lead and manager of the Barcelona Brain Health Initiative (BBHI), a large-scale longitudinal cohort study that has involved more than 6,000 volunteers.

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Following the symposium – Event for the General Public

Panel discussion: "Unveiling Hidden Threats: The Impact of Chemical Exposures and Endocrine Disruptors on Public Health"

Brief Description: Join us for a thought-provoking panel discussion as part of the Barcelona Exposome Symposium at the PRBB, open to the general public from 18-19h. This one-hour session will bring together leading researchers from ISGlobal, CSIC and other institutions to explore the invisible but generalized threats posed by chemical exposures and endocrine disruptors. Experts will present how these substances affect our health, disrupt hormonal systems, and what the latest research reveals about minimizing risks. The event aims to raise awareness, encourage dialogue and engage the community in understanding the impact of everyday chemicals on our well-being. Don't miss this opportunity to learn and interact with experts at the forefront of environmental health research!

Day: **September 25, 2024, as part of Researchers' Night 2024**

Time: 18-19h

Location: Centre Civic El Sortidor Plaça del Sortidor, 12, Sants-Montjuïc, 08004 Barcelona

Language: Catalan and Spanish

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