LECTURE SERIES & WORKSHOPS 2022 / HYBRID

# NEXT-GENERATION OF MULTI-OMICS RESEARCH: GOING TO THE SINGLE CELL

INFECTION & IMMUNITY

LUXEMBOURG INSTITUTE OF HEALTH

UNIVERSITÉ DU LUXEMBOURG

**08 JUNE 2022**

*Wednesday

45' (talk)

**11.00 - 11.45 am**

8 9 10 11 12 1 2 3

## Digital optimization of the feed-microbiome-host nexus


### ABSTRACT

As the human population expands towards 10 billion, pressure is being applied to food production systems to develop nutritious, efficient and sustainable practices, such as optimizing health benefits from food, improving feed conversion and animal welfare and mitigating harmful byproducts such as greenhouse gases (GHG). One promising route to achieve this, is combining the use of functional dietary components with a deeper understanding of the intimate genetic and physiological connection between animals and their microbiomes. However, first we must unlock critical and poorly understood microbiota and their biological pathways that control digestion as well as identify exploitable interactions that exist within the complexity of gut microbiomes. Our research seeks to combine high-resolution genome-guided meta-omics technologies with enzymology, bacteriology, bioinformatics and phenotyping of relevant digestive eco-systems from human and production animals (pigs, fish and ruminants). Herein we highlight how such an integrated approach can visualizes how distinctive dietary fibres stimulate known model microorganisms within a complex endogenous microbiome. We further reveal the metabolic influence of uncharacterized bacterial and eukaryotic populations that are surprisingly conserved across diverse dietary conditions and host species. Importantly, as we develop with the technological advancements, we are actively expanding our analyses further across the "holobiont", with the long-term objective being: to understand, monitor and ultimately manipulate host-microbiome interactions.



### SPEAKER

**Prof. Phil Pope**

Professor in Microbiology
Microbial Ecology and Meta-Omics (MEMO) Group
Norwegian University of Life Sciences


### HOSTS:

Department of Infection and Immunity (LIH)
University of Luxembourg

### RESPONSIBLE SCIENTIST:

Paul Wilmes / (paul.wilmes@uni.lu)
*University of Luxembourg*
*Luxembourg Centre for Systems Biomedicine*

***Please note that the lecture will take place in a hybrid format and you may register for in-person attendance by sending an email to florence.henry@lih.lu or join virtually via Webex:**

**Location:**

**University of Luxembourg**
CAMPUS BELVAL
Maison du Savoir
Room: MSA 3.040
*2, avenue de l'Université*
*L-4365 Esch-sur-Alzette*

**Webinar via webex:**

JOIN

Event number: 2731 355 7367
Event password: 9SDp7zkPuX5


**Supported by the Luxembourg National Research Fund**

Fonds National de la Recherche Luxembourg


**www.lih.lu**