



IABS

**Avoiding Antimicrobial Resistance:
Veterinary Use of Phages for Prevention, Therapy and Control of Bacterial
Infections**

***Virtual meeting
November 19-20, 2024***

The Veterinary Biologicals Committee (VBC) of the International Alliance for Biological Standardization (IABS; for description see below) will hold a scientific workshop on quality, safety and efficacy of bacteriophages for veterinary use. Veterinary medicine is confronted by the need to substantially reduce the use of antimicrobials as part of a joint effort by both human and veterinary medicine (One Health) to fight against antimicrobial resistance (AMR). Bacteriophages used alone, or in combination with antimicrobials are a supplementary tool to conventional antibiotics and have been developed for use in several areas, e.g. in aquaculture, bovine mastitis, pig diarrhea, control of salmonella in pigs, as well as for treatment of conditions in individual animals such as dermatitis in dogs.

Therefore, the workshop will focus on the use of phages to reduce antimicrobials use:

- Therapeutic use of phages in production and companions animals;
- Prophylactic use of phages in terrestrial and aquatic situations with the aim to reduce infectious pressure in animal holdings.

This workshop will create an ideal environment for discussion between regulators, academics and companies to facilitate the development of phages as an additional tool to reduce AMR and as a therapeutic tool for individual/herd treatment of resistant bacterial infections.

This meeting of the different stakeholders should promote a better understanding between regulators, researchers and companies developing phages: regulators can explain the existing regulatory framework (e.g. EMA guideline and EP chapter) and discuss their interpretation; companies can explain the drawbacks/difficulties in the industrial development of phages and possible solutions. This meeting will conclude with concrete suggestions on how access to market for phage products can be improved.

Scientific Committee

Etienne **Thiry** - chair, VBC vice chair, ULiège
Mia **Jakava-Viljanen** - VBC chair, Finnish Food Authority
Carmen **Jungbäck** - VBC member, IABS board secretary
Hans P. **Kleppen**
Bryce **Lunt** - Zoetis
David **Mackay** - VBC member
Paul **Midtlyng** - VBC member, Aquamedic AS
Egbert **Mundt** – EVA Pharma
Dusan **Palic** - VBC member, U München
Jean-Paul **Pirnay**- Queen Astrid Military Hospital, Brussels
Damien **Thiry** - ULiège
Jeffrey L. **Watts** - Zoetis

Workshop Program

Times are indicated CET

Day 1: Tuesday, November 19, 2024

- 1:30 pm *Technical and Organizational matter*
- 2:00 pm **Opening of the meeting - Welcome and introduction to the meeting**
Etienne THIRY, ULiège, Belgium

Keynote Session

- 2:10 pm **Keynote lecture: Phages and phage proteins in bacterial infection treatment**
Yves BRIERS, Ghent University, Belgium

Session I: Field use of phages to improve animal and human health: from population to individual treatment

Moderators: Paul MIDTLYNG, Dusan PALIC

- 2:50 pm **Use of phage in aquaculture: are we treating the water or the animals?**
Hans KLEPPEN, Norway
- 3:10 pm **Towards bacteriophage control of Campylobacter in the poultry rearing environment**
Ian CONNERTON, University of Nottingham, UK

- 3:30 pm **Phage therapy in pigs: observations on the control of zoonotic pathogens in pork production.**
Robert ATTERBURY, University of Nottingham, UK
- 3:50 pm *Break*
- 4:20 pm **A bacteriophage product against *Staphylococcus aureus* to treat bovine mastitis**
Hansjörg LEHNHERR, Phage Technology Center, Germany
- 4:40 pm **Phage therapy in humans, the “individual patient” approach**
Sarah DJEBARA, Queen Astrid Military Hospital, Belgium
- 5:00 pm **Phage therapy in companion animals: which way for an efficient treatment?**
Damien THIRY, ULiège, Belgium
- 5:20 pm *Q&A Session 1*
- 6:00 pm *End of Day 1*

Day 2: Wednesday, November 20, 2024

- 1:00 pm **Welcome address**
Etienne THIRY, ULiège, Belgium

Session II: Poster Session

Moderator: Etienne Thiry

- 1.10 pm **Exploiting *Campylobacter jejuni* phage receptor binding protein for rapid and specific bacterial detection.**
Su Zar Chi LWIN, Graduate School of Bioresource and Bioenvironmental Sciences, Japan
- 1.15 pm **In vitro efficacy and individual bacteriophage treatment of *P. aeruginosa* in dogs**
Eva Maria KALBHENN, Phage Center Bad Kissingen, Germany
- 1.20 pm **Identification of effective bacteriophages for mastitis prevention in goats**
Audrey ADDABLAH, Laval University, Canada
- 1.25 pm **Alphagos *Vibrio*, a tailored phage cocktail reduces *Vibrio parahaemolyticus* infection in Indonesian shrimp hatcheries**
Agnihah, PT Vaksindo Satwa Nusantara, Indonesia

- 1.30 pm **Therapeutic efficacy of bacteriophage cocktail against multidrug resistant *Streptococcus agalactiae* infection in *Oreochromis niloticus***
Prenanka RAJAN, Kerala University of Fisheries and Ocean Studies (KUFOS)
Ernakulam, India
- 1.35 pm **High performance genome annotation for a safer and faster-developing phage therapy**
Guillaume ABRIAT, Rime Bioinformatics SAS, France
- 1.40 pm **Alphagos, a tailored phage cocktail, controls multiple-Salmonella enterica strain colonization in broiler chickens**
Ilias THEODOROU, Phagos SAS, France
- 1.45 pm **Alphagos, a tailored phage cocktail, reduces *Salmonella enterica* colonization in chicken carcasses**
Marine FEYEREISE, Phagos SAS, France
- 1.50 pm **K1 Capsule-dependent phage-driven evolution in *Escherichia coli* leading to phage resistance and biofilm production**
Céline ANTOINE, ULiège, Belgium

Session III: Panel discussion: How to bring phage products for the treatment of animals to market?

Moderators: David MACKAY, Jean-Paul PIRNAY, Hans KLEPPEN

- 2:00 pm • **Introduction by David MACKAY**
- 2.10 pm • **Guideline on quality, safety and efficacy of veterinary medicinal products specifically designed for phage therapy**
Rosario BULLIDO & Susana CASADO, Spanish Agency of Medicines and Medical Devices (AEMPS), CVMP Novel Therapy WP, Spain
- 2.20 pm • **Activities of the European Pharmacopoeia in the field of bacteriophages**
Olga KOLAJ-ROBIN, European Directorate for the Quality of Medicines & Healthcare, France
- 2.30 pm • **Regulation of phages used in veterinary medicine in the U.S**
Emily CORNWELL, CVM, USA
Bruce THOMSEN, MRP-APHIS, USA
- 2.40 pm • **EFSA's experience in the risk assessment of bacteriophages intended to be used as feed additives**
Rosella BROZZI, European Food Safety Authority (EFSA), Italia

- 2.50 pm
- **Quality Control of Therapeutic Phages in Belgium**
Pieter-Jan CEYSSENS, Sciensano, Belgium
- 3.00 pm
- **The Importance of CMC for Bringing Animal Health Phage Products to Market**
Jeffrey L. WATTS, Zoetis, USA
- 3.10 pm
- **Phage therapy for veterinary applications from the perspective of a manufacturer**
Johan QUINTENS, Vésale Bioscience, Belgium
- 3:20 pm *Break*
- 4:00 pm **Panel Discussion**
Moderators: Paul MIDTLYNG, David MACKAY
- Examples of topics:*
- **How to choose the appropriate pathway?**
 - **What are the quality requirements, including manufacture / GMP that apply?**
 - **Are requirements for safety and efficacy sufficiently defined?**
 - **Scientific challenges that the panel would like to draw attention to?**
- 5:30 pm *Closing remarks*
- End of the meeting*