Center for European, Russian, and Eurasian Studies
MICHIGAN STATE UNIVERSITY

Phage Therapy as a Solution to Antimicrobial Resistance:

A perspective from Eliava Institute, Georgia

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Thursday,

Sep 5, 2024

10:00am (ET)

Room A214
Veterinary Medical Center
784 Wilson Rd
East Lansing

Online (Zoom):
Meeting ID: 94247272677
Passcode: 300937

Co-sponsored by:

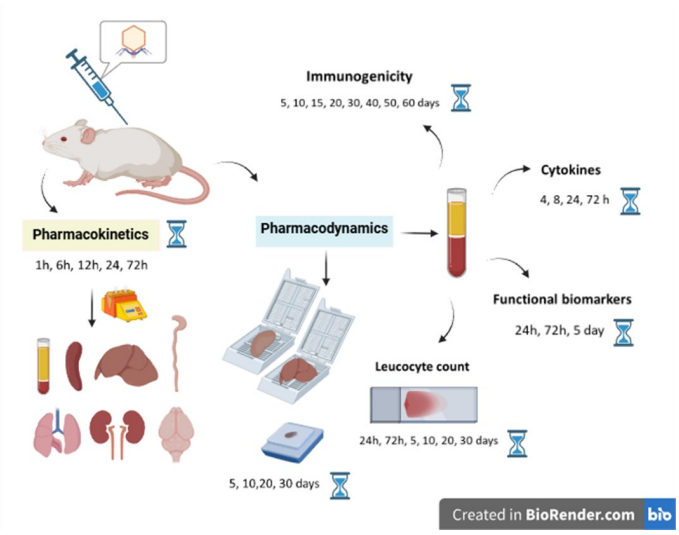
MSU Center for European, Russian, and Eurasian Studies

College of Veterinary Medicine

Department of Pathobiology and Diagnostic Investigation

Department of Biochemistry and Molecular Biology

Abstract



Antimicrobial resistance poses a significant challenge in healthcare, particularly among opportunistic pathogens, which exhibit complex diagnostic hurdles and an escalating prevalence of multiple drug resistance, often leading to mixed and endogenous infections. Obligate pathogens, by contrast, present a milder concern, with early diagnosis facilitated, effective vaccines available, and limited avenues for dissemination, coupled with a lack of antimicrobial resistance. Addressing antimicrobial resistance necessitates a multifaceted approach, including adherence to rational antimicrobial therapy principles and exploring alternative biological therapeutics such as phages. Phages offer distinct advantages over antibiotics, including lack of adverse effects, ability to penetrate and disrupt bacterial biofilms, function as self-dosing agents, adaptability to resistant strains, environmental safety, and cost-effectiveness.

There is a burgeoning interest in phage therapy globally. Western European nations are observing a steady increase in the establishment of enterprises and laboratories specifically dedicated to producing phage therapeutics. Phage therapy employs virulent (lytic) phages, typically in cocktail formulations, and offers a broad therapeutic spectrum against various tissue purulent infections and intestinal diseases. Prior to treatment initiation, phage sensitivity testing via phage-gram is essential. resistance.

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Phages are administered over 2-3 weeks, with a dosing regimen of 2-3 times daily, typically ranging from 10^5-10^8 phage particles per administration. Additionally, phages exert an indirect immune-modulating effect, augmenting their therapeutic efficacy and showcasing adjuvant and vaccine-like actions.

Large-scale technologies for endotoxin purification, notably tangential filtration, are imperative to facilitate the widespread adoption of phage therapy. Furthermore, future phage formulations should incorporate long-circulating and low-immunogenic variants to mitigate humoral immune responses.

The abundant diversity of phages in the environment ensures the availability of effective options against antimicrobial-resistant bacteria. Formally approving phage therapy and refining treatment protocols are crucial for its ongoing advancement and clinical utility.

Bio:

Beso Lasareishvili specializes in veterinary medicine, biotechnology, and immunology. He holds master's degrees in these fields from three Georgian state universities and completed his PhD research on immunosenescence. Dr. Lasareishvili is a principal investigator at the Eliava Institute of Bacteriophage, Microbiology, and Immunology. Concurrently, he serves as the dean of the Veterinary Medical School at the Agricultural University of Georgia, where he leads the Laboratory of Antimicrobial Resistance and Experimental Phage Therapy and teaches courses in immunology and related subjects, including vaccinology, immunopathology, and infectious diseases. His research primarily explores the influence of bacteriophages' physicochemical properties on pharmacokinetics and immunogenicity. Dr. Lasareishvili has pursued advanced training at several leading institutions, including the DRFZ, Charité University, and Hohenheim University in Germany, MSU and Augusta University in the USA, and the Hirschfeld Institute of Immunology and Experimental Therapy in Poland. His academic work is complemented by active involvement in numerous professional associations and scientific and educational communities.