

Bacterial Viruses

Exploitation for Biocontrol and Therapeutics

Edited by

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Dedication

This publication is dedicated to:

Charles Daly
Gerald Fitzgerald
Paul Ross
Elke Arendt
and
Colm Murphy

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Preface

The potential of bacterial viruses (bacteriophages or phages) as antibacterial agents was recognised over a century ago. However, the success of antibiotic therapy from the 1940s onwards caused a general decline in the applications of phages as therapeutics. Nonetheless, recent decades have seen a disquieting proliferation of pathogenic bacteria resistant to multiple antibiotics commonly used in human and veterinary medicine, in turn leading towards a crisis in public health. The renewed exploration of phages and their molecular components for biocontrol and therapeutics offers a complementary approach for eliminating problematic bacteria across a range of sectors where bacterial infections and contaminations are a persistent problem.

Written by internationally-recognised scientists involved in the exploitation of bacterial viruses in diverse areas from around the world, this book provides comprehensive coverage of the current research in several phage applications for biocontrol of undesirable bacteria in human and veterinary medicine, horticulture, aquaculture and food. Chapters from the famous centres of phage therapy in Wrocław and Tbilisi detail some of the pioneering historical contributions to the topic. The book also examines the impact of phages on the human microbiome as well as the progress of research in phage engineering, phage enzymes, phage delivery systems, biodetection as well as intellectual property aspects.

Aidan Coffey and Colin Buttimer

Editor Biographies

Aidan Coffey is a Principal Investigator and Professor at the Centre for Advanced Therapeutic Engineering at Cork Institute of Technology (Cork, Ireland) and an Adjunct Professor with the Microbiology Department at University College Cork (UCC). He is the author of over 200 research papers, and he has also served in scientific working groups at the European Food Safety Authority. His journey on bacterial virus research began with his PhD on bacteriophage resistance in lactic acid bacteria under the direction of Charles Daly and Gerald Fitzgerald at UCC, graduating in 1991. Following the completion of a Marie Curie postdoctoral fellowship at Wageningen University in the Netherlands where he worked with pathogenic bacteria at the laboratory of Tjakko Abee, he took up a Senior Research Officer post at the Irish Agriculture and Food Development Authority (Teagasc) with the group of Paul Ross. In 1998, he began isolating and characterising bacteriophages active against animal and human infectious bacteria, continuing the topic after transferring from Teagasc to his current post in 2002.

Colin Buttmer completed his PhD in 2018 in the research group of Aidan Coffey at Cork Institute of Technology. There, he worked on bacteriophages of Gram-negative phytopathogens of the genera *Pectobacterium* and *Erwinia*, collaborating and publishing with bacteriophage scientists at KU Leuven and ETH Zurich. His early career research made a significant contribution to the field by leading to the establishment of three novel phage genera. He currently works on phages of the human gut microbiome and their potential application for human phage therapy at the APC Microbiome Ireland, University College Cork in the research group of Colin Hill.