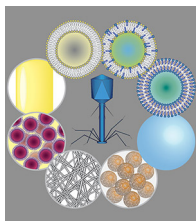


CONTENTS • MARCH 2021 • VOLUME 87, NO. 5

COVER IMAGE



Cover photograph: As an alternative to antibiotics, therapeutic bacteriophages can be used to treat bacterial infections, in particular those caused by multidrug-resistant pathogens. However, for many applications, stable formulations of the phages are required in order to ensure their stability and activity as well as their delivery to the site of infection. Encapsulation is one of the most important issues for the development of phage therapy into a standard clinical treatment for bacterial infections. The illustration displays the variety of encapsulation methods that have been developed for phages (in the center), from liposomes and hydrogels to thin films and fibers. (See related article at e01979-20.) (Copyright © 2021 Loh et al. CC-BY 4.0.)

SPOTLIGHT

Articles of Significant Interest in This Issue

e03139-20

MINIREVIEWS

Encapsulation and Delivery of Therapeutic Phages

e01979-20

Belinda Loh, Vijay Singh Gondil, Prasanth Manohar, Fazal Mehmood Khan, Hang Yang, Sebastian Leptihn

The Symbiotic “All-Rounders”: Partnerships between Marine Animals and Chemosynthetic Nitrogen-Fixing Bacteria

e02129-20

Jillian M. Petersen, Benedict Yuen

The *Roseobacter*-Group Bacterium *Phaeobacter* as a Safe Probiotic Solution for Aquaculture

e02581-20

Eva C. Sonnenschein, Guillermo Jimenez, Mathieu Castex, Lone Gram

BIOTECHNOLOGY

Simultaneous Directed Evolution of Coupled Enzymes for Efficient Asymmetric Synthesis of L-Phosphinothricin

e02563-20

Feng Cheng, Qing-Hua Li, Hua-Yue Zhang, Lan Wei, Jia-Min Zhang, Ju-Mou Li, Ya-Ping Xue, Yu-Guo Zheng

ENVIRONMENTAL MICROBIOLOGY

Bioelectrochemical Fixation of Nitrogen to Extracellular Ammonium by *Pseudomonas stutzeri*

e01998-20

Shanshan Chen, Xianyue Jing, Yongliang Yan, Shaofu Huang, Xing Liu, Piao Chen, Shungui Zhou

The Organosulfur Compound Dimethylsulfoniopropionate (DMSP) Is Utilized as an Osmoprotectant by *Vibrio* Species

e02235-20

Gwendolyn J. Gregory, Katherine E. Boas, E. Fidelma Boyd

A Novel Antidipteran *Bacillus thuringiensis* Strain: Unusual Cry Toxin Genes in a Highly Dynamic Plasmid Environment

e02294-20

Nancy Fayad, Zakaria Kambris, Laure El Chamy, Jacques Mahillon, Mireille Kallassy Awad

Enhancement of Nitrous Oxide Emissions in Soil Microbial Consortia via Copper Competition between Proteobacterial Methanotrophs and Denitrifiers

e02301-20

Jin Chang, Daehyun D. Kim, Jeremy D. Semrau, Ju Yong Lee, Hokwan Heo, Wenyu Gu, Sukhwan Yoon

No Endospore Formation Confirmed in Members of the Phylum <i>Proteobacteria</i>	e02312-20
<i>Polina Beskrovnaya, Doaa Fakih, Isabelle Morneau, Ameena Hashimi, Dainelys Guadarrama Bello, Shiwei Xing, Antonio Nanci, Tao Huan, Elitza I. Tocheva</i>	
<i>Myxococcus xanthus</i> Predation of Gram-Positive or Gram-Negative Bacteria Is Mediated by Different Bacteriolytic Mechanisms	e02382-20
<i>Kirstin I. Arend, Janka J. Schmidt, Tim Bentler, Carina Luchtefeld, Daniel Eggerichs, Hannah M. Hexamer, Christine Kaimer</i>	
<i>Aspergillus fumigatus</i> Cross-Resistance between Clinical and Demethylase Inhibitor Azole Drugs	e02539-20
<i>Rocio Garcia-Rubio, Irene Gonzalez-Jimenez, Jose Lucio, Emilia Mellado</i>	
Evolution of Diverse Effective N₂-Fixing Microsymbionts of <i>Cicer arietinum</i> following Horizontal Transfer of the <i>Mesorhizobium ciceri</i> CC1192 Symbiosis Integrative and Conjugative Element	e02558-20
<i>Yvette Hill, Elena Colombi, Emma Bonello, Timothy Haskett, Joshua Ramsay, Graham O'Hara, Jason Terpolilli</i>	
Method for Measuring Phenotypic Colistin Resistance in <i>Escherichia coli</i> Populations from Chicken Flocks	e02597-20
<i>Nguyen Thi Nhung, Nguyen Thi Phuong Yen, Nguyen Van Ky Thien, Nguyen Van Cuong, Bach Tuan Kiet, James Campbell, Guy Thwaites, Stephen Baker, Ronald B. Geskus, Juan Carrique-Mas</i>	
<i>Aeromonas</i> Species from Nonchlorinated Distribution Systems and Their Competitive Planktonic Growth in Drinking Water	e02867-20
<i>Nikki van Bel, Paul van der Wielen, Bart Wullings, Jeroen van Rijn, Ed van der Mark, Henk Ketelaars, Wim Hijnen</i>	
ENZYMOLGY AND PROTEIN ENGINEERING	
New Family of Carbohydrate-Binding Modules Defined by a Galactosyl-Binding Protein Module from a <i>Cellvibrio japonicus</i> Endo-Xyloglucanase	e02634-20
<i>Mohamed A. Attia, Harry Brumer</i>	
FOOD MICROBIOLOGY	
Implementation of ATP and Microbial Indicator Testing for Hygiene Monitoring in a Tofu Production Facility Improves Product Quality and Hygienic Conditions of Food Contact Surfaces: a Case Study	e02278-20
<i>Jonathan H. Sogin, Gabriela Lopez-Velasco, Burcu Yordem, Cari K. Lingle, John M. David, Mario Çobo, Randy W. Worobo</i>	
Influence of Single Nitrogen Compounds on Growth and Fermentation Performance of <i>Starmerella bacillaris</i> and <i>Saccharomyces cerevisiae</i> during Alcoholic Fermentation	e02485-20
<i>Vasileios Englezos, Luca Cocolin, Kalliopi Rantsiou, Anne Ortiz-Julien, Audrey Bloem, Pauline Seguinot, Carole Camarasa</i>	
Staphylococcal Enterotoxin Gene Cluster: Prediction of Enterotoxin (SEG and SEI) Production and of the Source of Food Poisoning on the Basis of vSaß Typing	e02662-20
<i>L. Schwendimann, D. Merda, T. Berger, S. Denayer, C. Feraudet-Tarisse, A. J. Kläui, S. Messio, M. Y. Mistou, Y. Nia, J. A. Hennekinne, H. U. Graber</i>	

GENETICS AND MOLECULAR BIOLOGY

YbeY Controls the Type III and Type VI Secretion Systems and Biofilm Formation through RetS in *Pseudomonas aeruginosa* e02171-20

Yushan Xia, Congjuan Xu, Dan Wang, Yuding Weng, Yongxin Jin, Fang Bai, Zhihui Cheng, Oscar P. Kuipers, Weihui Wu

A Viability Quantitative PCR Dilemma: Are Longer Amplicons Better? e02653-20

Wannes Van Holm, Justien Ghesquière, Nico Boon, Tim Verspecht, Kristel Bernaerts, Naiera Zayed, Ioanna Chatzigiannidou, Wim Teughels

INVERTEBRATE MICROBIOLOGY

Hindgut Microbiota Reflects Different Digestive Strategies in Dung Beetles (Coleoptera: Scarabaeidae: Scarabaeinae) e02100-20

Kathryn M. Ebert, William G. Arnold, Paul R. Ebert, David J. Merritt

Cry75Aa (Mpp75Aa) Insecticidal Proteins for Controlling the Western Corn Rootworm, *Diabrotica virgifera virgifera* LeConte (Coleoptera: Chrysomelidae), Isolated from the Insect-Pathogenic Bacterium *Brevibacillus laterosporus* e02507-20

David Bowen, Yong Yin, Stanislaw Flasiński, Catherine Chay, Gregory Bean, Jason Milligan, William Moar, Aihong Pan, Brent Werner, Karrie Buckman, Arlene Howe, Todd Ciche, Keith Turner, Michael Pleau, Jun Zhang, Jean-Louis Kouadio, Bruce E. Hibbard, Paula Price, James Roberts

MICROBIAL ECOLOGY

***Blastomyces dermatitidis* Environmental Prevalence in Minnesota: Analysis and Modeling Using Soil Collected at Basal and Outbreak Sites** e01922-20

Katrina M. Jackson, Keith C. Pelletier, Joni Scheftel, Joshua D. Kerkaert, Serina L. Robinson, Tami McDonald, Jeff B. Bender, Joseph F. Knight, Malia Ireland, Kirsten Nielsen

Influence of Spatial Scale on Structure of Soil Bacterial Communities across an Arctic Landscape e02220-20

Lucie A. Malard, Muhammad Z. Anwar, Carsten S. Jacobsen, David A. Pearce

Recovery of Methanotrophic Activity Is Not Reflected in the Methane-Driven Interaction Network after Peat Mining e02355-20

Thomas Kaupper, Lucas W. Mendes, Monica Harnisz, Sascha M. B. Krause, Marcus A. Horn, Adrian Ho

A Large Tn7-like Transposon Confers Hyperresistance to Copper in *Pseudomonas syringae* pv. *syringae* e02528-20

Francesca Aprile, Zaira Heredia-Ponce, Francisco M. Cazorla, Antonio de Vicente, José A. Gutiérrez-Barranquero

Arid Ecosystem Vegetation Canopy-Gap Dichotomy: Influence on Soil Microbial Composition and Nutrient Cycling Functional Potential e02780-20

Priyanka Kushwaha, Julia W. Neilson, Albert Barberán, Yongjian Chen, Catherine G. Fontana, Bradley J. Butterfield, Raina M. Maier

PHYSIOLOGY

L-Arabinose Induces the Formation of Viable Nonproliferating Spheroplasts in *Vibrio cholerae* e02305-20

Elena Espinosa, Sandra Daniel, Sara B. Hernández, Anthony Goudin, Felipe Cava, François-Xavier Barre, Elisa Galli

Integrated Transcriptome Sequencing (RNA-seq) and Proteomic Studies Reveal Resource Reallocation towards Energy Metabolism and Defense in *Skeletonema marinoi* in Response to CO₂ Increase e02614-20

Mei Zhang, Yu Zhen, Tiezhu Mi, Senjie Lin

PLANT MICROBIOLOGY

Agricultural Soil Management Practices Differentially Shape the Bacterial and Fungal Microbiomes of *Sorghum bicolor* e02345-20

Heidi M.-L. Wipf, Ling Xu, Cheng Gao, Hannah B. Spinner, John Taylor, Peggy Lemaux, Jeffrey Mitchell, Devin Coleman-Derr

PUBLIC AND ENVIRONMENTAL HEALTH MICROBIOLOGY

The Shared Resistome of Human and Pig Microbiota Is Mobilized by Distinct Genetic Elements e01910-20

Chao Wang, Yuqin Song, Na Tang, Gang Zhang, Sébastien Olivier Leclercq, Jie Feng

Plant-Scale Validation of Physical Heat Treatment of Poultry Litter Composts Using Surrogate and Indicator Microorganisms for *Salmonella* e02234-20

Hongye Wang, Zhao Chen, Muthu Dharmasena, Annel K. Greene, Brian McSpadden Gardener, Blaize Holden, Xiuping Jiang