

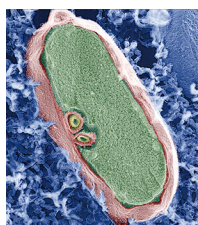


AMERICAN
SOCIETY FOR
MICROBIOLOGY

Applied and Environmental
Microbiology®

CONTENTS • OCTOBER 2020 • VOLUME 86, NO. 20

COVER IMAGE



Cover photograph: Double-lamellar membrane vesicles accumulated in the periplasm of a *Buttiauxella agrestis* JCM 1090^T $\Delta tolB$ mutant. Membrane vesicle formation has been recognized as a common mechanism in prokaryotes, and membrane vesicles play critical roles in intercellular interaction. This mutant strain has unique characteristics relative to previously observed bacterial cells, and diverse types of outer membrane vesicles, including multilamellar and multivesicular outer membrane vesicles, are released into the extracellular milieu. In this image, a vesicle is invaginated into the bacterial cell at the outer membrane, and it is probably in the process of triple-lamellar membrane vesicle formation. (See related article at e01131-20.) (Copyright © 2020 American Society for Microbiology. All Rights Reserved.)

SPOTLIGHT

Articles of Significant Interest in This Issue

e02055-20

BIOTECHNOLOGY

Deletion of a Peptidylprolyl Isomerase Gene Results in the Inability of *Caldicellulosiruptor bescii* To Grow on Crystalline Cellulose without Affecting Protein Glycosylation or Growth on Soluble Substrates

e00909-20

Jordan F. Russell, Matthew L. Russo, Xuewen Wang, Neal Hengge, Daehwan Chung, Lance Wells, Yannick J. Bomble, Janet Westpheling

Ribosome-Engineered *Lacticaseibacillus rhamnosus* Strain GG Exhibits Cell Surface Glyceraldehyde-3-Phosphate Dehydrogenase Accumulation and Enhanced Adhesion to Human Colonic Mucin

e01448-20

Minori Ishida, Fu Namai, Suguru Shigemori, Shoko Kajikawa, Masami Tsukagoshi, Takashi Sato, Tasuku Ogita, Takeshi Shimosato

Multiplex Design of the Metabolic Network for Production of L-Homoserine in *Escherichia coli*

e01477-20

Peng Liu, Bo Zhang, Zhen-Hao Yao, Zhi-Qiang Liu, Yu-Guo Zheng

A New Approach for Evaluating Electron Transfer Dynamics by Using *In Situ* Resonance Raman Microscopy and Chronoamperometry in Conjunction with a Dynamic Model

e01535-20

Adolf Krige, Kerstin Ramser, Magnus Sjöblom, Paul Christakopoulos, Ulrika Rova

Novel Selective Inhibition of *Lactobacillus iners* by *Lactobacillus*-Derived Bacteriocins

e01594-20

Trine Nilsen, Iwona Swedek, Laurel A. Lagenaur, Thomas P. Parks

ENVIRONMENTAL MICROBIOLOGY

Genetic and Phenotypic Factors Associated with Persistent Shedding of Shiga Toxin-Producing *Escherichia coli* by Beef Cattle

e01292-20

Heather M. Blankenship, Samantha Carbonell, Rebekah E. Mosci, Karen McWilliams, Karen Pietrzen, Scott Benko, Ted Gatesy, Daniel Grooms, Shannon D. Manning

Systematic Analysis of *Escherichia coli* Isolates from Sheep and Cattle Suggests Adaption to the Rumen Niche

e01417-20

Jian Pang, Zhanying Liu, Qiancheng Zhang, Xuemei Lu, Qingsheng Qi

Implications of Foraging and Interspecies Interactions of Birds for Carriage of *Escherichia coli* Strains Resistant to Critically Important Antimicrobials

e01610-20

Shewli Mukerji, Samantha Gunasekera, James Nicholas Dunlop, Marc Stegger, David Jordan, Tanya Laird, Rebecca Jane Abraham, Mary Barton, Mark O'Dea, Sam Abraham

- The Intermediates in Branched-Chain Amino Acid Biosynthesis Are Indispensable for Conidial Germination of the Insect-Pathogenic Fungus *Metarhizium robertsii*** e01682-20
Feifei Luo, Hongxia Zhou, Xue Zhou, Xiangyun Xie, You Li, Fenglin Hu, Bo Huang
- Use of Newly Designed Primers for Quantification of Complete Ammonia-Oxidizing (Comammox) Bacterial Clades and Strict Nitrite Oxidizers in the Genus *Nitrospira*** e01775-20
Ran Jiang, Jian-Gong Wang, Ting Zhu, Bin Zou, Dan-Qi Wang, Sung-Keun Rhee, Dong An, Zhi-Yuan Ji, Zhe-Xue Quan
- FOOD MICROBIOLOGY**
- Longitudinal Assessment of the Dynamics of *Escherichia coli*, Total Coliforms, *Enterococcus* spp., and *Aeromonas* spp. in Alternative Irrigation Water Sources: a CONSERVE Study** e00342-20
Sultana Solaiman, Sarah M. Allard, Mary Theresa Callahan, Chengsheng Jiang, Eric Handy, Cheryl East, Joseph Haymaker, Anthony Bui, Hillary Craddock, Rianna Murray, Prachi Kulkarni, Brienna Anderson-Coughlin, Shani Craighead, Samantha Gartley, Adam Vanore, Rico Duncan, Derek Foust, Maryam Taabodi, Amir Sapkota, Eric May, Fawzy Hashem, Salina Parveen, Kalmia Kniel, Manan Sharma, Amy R. Sapkota, Shirley A. Micallef
- Arcobacter* Identification and Species Determination Using Raman Spectroscopy Combined with Neural Networks** e00924-20
Kaidi Wang, Lei Chen, Xiangyun Ma, Lina Ma, Keng C. Chou, Yankai Cao, Izhar U. H. Khan, Greta Gözl, Xiaonan Lu
- A Multicenter Proposal for a Fast Tool To Screen Biosecure Chicken Flocks for the Foodborne Pathogen *Campylobacter*** e01051-20
Jeffrey Hoorfar, Ivana Koláčková, Gro S. Johannessen, Giuliano Garofolo, Francesca Marotta, Kinga Wiczorek, Jacek Osek, Mona Torp, Bjørn Spilsberg, Camilla Sekse, Natasia Rebekka Thornval, Renáta Karpíšková
- Sharing a β -Glucan Meal: Transcriptomic Eavesdropping on a *Bacteroides ovatus*-*Subdoligranulum variabile*-*Hungatella hathewayi* Consortium** e01651-20
Manuela Centanni, Ian M. Sims, Tracey J. Bell, Ambarish Biswas, Gerald W. Tannock
- GENETICS AND MOLECULAR BIOLOGY**
- Alterocin, an Antibiofilm Protein Secreted by *Pseudoalteromonas* sp. Strain 3J6** e00893-20
Albane Jouault, Angélique Gobet, Marjolaine Simon, Emilie Portier, Morgan Perennou, Erwan Corre, Fanny Gaillard, David Vallenet, Gurvan Michel, Yannick Fleury, Alexis Bazire, Alain Dufour
- Genetic Determinants of *Salmonella* Resistance to the Biofilm-Inhibitory Effects of a Synthetic 4-Oxazolidinone Analog** e01120-20
K. F. Griewisch, J. G. Pierce, J. R. Effenbein
- Multilamellar and Multivesicular Outer Membrane Vesicles Produced by a *Buttiauxella agrestis* tolB Mutant** e01131-20
Kotaro Takaki, Yuhei O. Tahara, Nao Nakamichi, Yusuke Hasegawa, Masaki Shintani, Moriya Ohkuma, Makoto Miyata, Hiroyuki Futamata, Yosuke Tashiro
- Impact on Multiple Antibiotic Pathways Reveals MtrA as a Master Regulator of Antibiotic Production in *Streptomyces* spp. and Potentially in Other Actinobacteria** e01201-20
Yanping Zhu, Peipei Zhang, Jing Zhang, Jiao Wang, Yinhua Lu, Xiuhua Pang

- A Novel Two-Component System, XygS/XygR, Positively Regulates Xyloglucan Degradation, Import, and Catabolism in *Ruminiclostridium cellulolyticum*** e01357-20
Clara Kampik, Yann Denis, Sandrine Pagès, Stéphanie Perret, Chantal Tardif, Henri-Pierre Fierobe, Pascale de Philip
- Biosynthesis Gene Cluster and Oxazole Ring Formation Enzyme for Inthomycins in *Streptomyces* sp. Strain SYP-A7193** e01388-20
Shao-Yang Hou, Meng-Yue Zhang, Hong-Da Wang, Yi-Xuan Zhang
- Roles of RcsA, an AhpD Family Protein, in Reactive Chlorine Stress Resistance and Virulence in *Pseudomonas aeruginosa*** e01480-20
Benya Nontaleerak, Jintana Duang-nkern, Lampet Wongsaraj, Wachareeporn Trinachartvanit, Adisak Romsang, Skorn Mongkolsuk
- Two CRISPR/Cas9 Systems Developed in *Thermomyces dupontii* and Characterization of Key Gene Functions in Thermolide Biosynthesis and Fungal Adaptation** e01486-20
Wei-Ping Huang, Yuan-Jiang Du, Yun Yang, Jia-Ning He, Qian Lei, Xiao-Yu Yang, Ke-Qin Zhang, Xue-Mei Niu
- Novel Biochemical Properties and Physiological Role of the Flavin Mononucleotide Oxidoreductase YhdA from *Bacillus subtilis*** e01688-20
Luz I. Valenzuela-García, Blanca L. Zapata, Norma Ramírez-Ramírez, Juan P. Huchin-Mian, Eduardo A. Robleto, Víctor M. Ayala-García, Mario Pedraza-Reyes
- METHODS**
- Development of Strong Anaerobic Fluorescent Reporters for *Clostridium acetobutylicum* and *Clostridium ljungdahlii* Using HaloTag and SNAP-tag Proteins** e01271-20
Kamil Charubin, Hannah Streett, Eleftherios Terry Papoutsakis
- MICROBIAL ECOLOGY**
- Merging Metagenomics and Spatial Epidemiology To Understand the Distribution of Antimicrobial Resistance Genes from *Enterobacteriaceae* in Wild Owls** e00571-20
Elizabeth A. Miller, Julia B. Ponder, Michelle Willette, Timothy J. Johnson, Kimberly L. VanderWaal
- Nitrite Production from Nitrate and Its Link with Lactate Metabolism in Oral *Veillonella* spp.** e01255-20
Dimas Prasetyanto Wicaksono, Jumpei Washio, Yuki Abiko, Hitomi Domon, Nobuhiro Takahashi
- Long-Term Fluctuation of Oral Biofilm Microbiota following Different Dietary Phases** e01421-20
Annette Carola Anderson, Michael Rothballer, Markus Jörg Altenburger, Johan Peter Woelber, Lamprini Karygianni, Kirstin Vach, Elmar Hellwig, Ali Al-Ahmad
- Tissue Tropisms and Transstadial Transmission of a *Rickettsia* Endosymbiont in the Highland Midge, *Culicoides impunctatus* (Diptera: Ceratopogonidae)** e01492-20
Jack Pilgrim, Stefanos Siozios, Matthew Baylis, Gregory D. D. Hurst
- Regularized S-Map Reveals Varying Bacterial Interactions** e01615-20
Zhong Yu, Zhihao Gan, Hao Huang, Yuelan Zhu, Fangang Meng
- PHYSIOLOGY**
- Induction of Daptomycin Tolerance in *Enterococcus faecalis* by Fatty Acid Combinations** e01178-20
William Brewer, Johnathan Harrison, Holly E. Saito, Elizabeth M. Fozo

- Differential Effects of Heated Perfusate on Morphology, Viability, and Dissemination of *Staphylococcus epidermidis* Biofilms** e01193-20
Joanne K. Beckwith, J. Scott VanEpps, Michael J. Solomon

PUBLIC AND ENVIRONMENTAL HEALTH MICROBIOLOGY

- Novel Avian Pathogenic *Escherichia coli* Genes Responsible for Adhesion to Chicken and Human Cell Lines** e01068-20
Aamir Ali, Rafał Kolenda, Muhammad Moman Khan, Jörg Weinreich, Ganwu Li, Lothar H. Wieler, Karsten Tedin, Dirk Roggenbuck, Peter Schierack

- Search for *Campylobacter* spp. Reveals High Prevalence and Pronounced Genetic Diversity of *Arcobacter butzleri* in Floodwater Samples Associated with Hurricane Florence in North Carolina, USA** e01118-20
Jeffrey A. Niedermeyer, William G. Miller, Emma Yee, Angela Harris, Ryan E. Emanuel, Theo Jass, Natalie Nelson, Sophia Kathariou

- Antibacterial and Antivirulence Activity of Manuka Honey against Genetically Diverse *Staphylococcus pseudintermedius* Strains** e01768-20
Helen L. Brown, Georgie Metters, Matthew D. Hitchings, Thomas S. Wilkinson, Luis Sousa, Jenna Cooper, Harry Dance, Robert J. Atterbury, Rowena Jenkins