



June 2013
Volume 195
Number 12
Published Twice Monthly



AMERICAN
SOCIETY FOR
MICROBIOLOGY

JB

Journal of Bacteriology

TABLE OF CONTENTS

ARTICLES

Periodic Reversals in <i>Paenibacillus dendritiformis</i> Swarming	Avraham Be'er, Shinji K. Strain, Roberto A. Hernández, Eshel Ben-Jacob, E.-L. Florin	2709–2717
Secretion of TcpF by the <i>Vibrio cholerae</i> Toxin-Coregulated Pilus Biogenesis Apparatus Requires an N-Terminal Determinant	Christina J. Megli, Ronald K. Taylor	2718–2727
Biochemical and Structural Studies of the <i>Mycobacterium tuberculosis</i> O ⁶ -Methylguanine Methyltransferase and Mutated Variants	Riccardo Miggiano, Valentina Casazza, Silvia Garavaglia, Maria Ciaramella, Giuseppe Perugini, Menico Rizzi, Franca Rossi	2728–2736
Nontypeable <i>Haemophilus influenzae</i> Carbonic Anhydrase Is Important for Environmental and Intracellular Survival	Jeroen D. Langereis, Aldert Zomer, Hendrik G. Stunnenberg, Peter Burghout, Peter W. M. Hermans	2737–2746
A Combination of Glycerol and Manganese Promotes Biofilm Formation in <i>Bacillus subtilis</i> via Histidine Kinase KinD Signaling	Moshe Shemesh, Yunrong Chai	2747–2754
The <i>Escherichia coli</i> Cpx Envelope Stress Response Regulates Genes of Diverse Function That Impact Antibiotic Resistance and Membrane Integrity	Tracy L. Raivio, Shannon K. D. Leblanc, Nancy L. Price	2755–2767
Identification of a Hotdog Fold Thioesterase Involved in the Biosynthesis of Menaquinone in <i>Escherichia coli</i>	Minjiao Chen, Xinyu Ma, Xiaolei Chen, Ming Jiang, Haigang Song, Zhihong Guo	2768–2775
Endogenous Mutagenesis in Recombinant <i>Sulfolobus</i> Plasmids	Cynthia J. Sakofsky, Dennis W. Grogan	2776–2785
Evolution of Pan-Genomes of <i>Escherichia coli</i> , <i>Shigella</i> spp., and <i>Salmonella enterica</i>	Evgeny N. Gordienko, Marat D. Kazanov, Mikhail S. Gelfand	2786–2792
Features of Pro- σ^K Important for Cleavage by SpoIVFB, an Intramembrane Metalloprotease	Ruanbao Zhou, Kangming Chen, Xianling Xiang, Liping Gu, Lee Kroos	2793–2806
Nonnative Disulfide Bond Formation Activates the σ^{32} -Dependent Heat Shock Response in <i>Escherichia coli</i>	Alexandra Müller, Jörg H. Hoffmann, Helmut E. Meyer, Franz Narberhaus, Ursula Jakob, Lars I. Leichert	2807–2816
Defining the <i>Escherichia coli</i> SecA Dimer Interface Residues through <i>In Vivo</i> Site-Specific Photo-Cross-Linking	Dongmei Yu, Andy J. Wowor, James L. Cole, Debra A. Kendall	2817–2825
Crystal Structure and Mode of Helicase Binding of the C-Terminal Domain of Primase from <i>Helicobacter pylori</i>	Syed Arif Abdul Rehman, Vijay Verma, Mohit Mazumder, Suman K. Dhar, S. Gourinath	2826–2838
Polyphosphate Deficiency in <i>Mycobacterium tuberculosis</i> Is Associated with Enhanced Drug Susceptibility and Impaired Growth in Guinea Pigs	Ramandeep Singh, Mamta Singh, Garima Arora, Santosh Kumar, Prabhakar Tiwari, Saqib Kidwai	2839–2851
Analysis of Novel Iron-Regulated, Surface-Anchored Hemin-Binding Proteins in <i>Corynebacterium diphtheriae</i>	Courtnei E. Allen, Jonathan M. Burgos, Michael P. Schmitt	2852–2863
Evidence that a Metabolic Microcompartment Contains and Recycles Private Cofactor Pools	Douglas L. Huseby, John R. Roth	2864–2879

FrnE, a Cadmium-Inducible Protein in <i>Deinococcus radiodurans</i>, Is Characterized as a Disulfide Isomerase Chaperone <i>In Vitro</i> and for Its Role in Oxidative Stress Tolerance <i>In Vivo</i>	Nivedita P. Khairnar, Min-Ho Joe, H. S. Misra, Sang-Yong Lim, Dong-Ho Kim	2880–2886
Transcriptional Regulation and Characteristics of a Novel <i>N</i>-Acetylmuramoyl-L-Alanine Amidase Gene Involved in <i>Bacillus thuringiensis</i> Mother Cell Lysis	Jingni Yang, Qi Peng, Zhen Chen, Chao Deng, Changlong Shu, Jie Zhang, Dafang Huang, Fuping Song	2887–2897
Mutations in <i>Escherichia coli</i> ExbB Transmembrane Domains Identify Scaffolding and Signal Transduction Functions and Exclude Participation in a Proton Pathway	Kristin R. Baker, Kathleen Postle	2898–2911
Core-Gene-Encoded Peptide Regulating Virulence-Associated Traits in <i>Streptococcus mutans</i>	Jeong Nam Kim, Michael J. Stanhope, Robert A. Burne	2912–2920
<i>Paracoccus denitrificans</i> PD1222 Utilizes Hypotaurine via Transamination Followed by Spontaneous Desulfination To Yield Acetaldehyde and, Finally, Acetate for Growth	Ann-Katrin Felix, Karin Denger, Michael Weiss, Alasdair M. Cook, David Schleheck	2921–2930
Unique Regulatory Mechanism of Sporulation and Enterotoxin Production in <i>Clostridium perfringens</i>	Kaori Ohtani, Hideki Hirakawa, Daniel Paredes-Sabja, Kosuke Tashiro, Satoru Kuhara, Mahfuzur R. Sarker, Tohru Shimizu	2931–2936
Structural Requirement in <i>Clostridium perfringens</i> Collagenase mRNA 5' Leader Sequence for Translational Induction through Small RNA-mRNA Base Pairing	Nozomu Obana, Nobuhiko Nomura, Kouji Nakamura	2937–2946

Cover photograph (Copyright © 2013, American Society for Microbiology. All Rights Reserved.): *Paenibacillus dendritiformis* morphotype C is a long and straight, rod-shaped, motile bacterial species that forms complex colonies when grown on agar plates. Starting from a circular inoculation, the hyperflagellated cells swarm outwards, in a unique back-and-forth periodic motion, forming curly branches with a well-defined handedness. The patterns formed reflect the various intricate interactions between these social bacteria but depend on the environmental conditions. The image shows a colony that grew on a soft agar with poor nutrients. These conditions led to a special transition in the size of the curls: large at the interior, then small at the edges. (Photo courtesy of Avraham Be'er.) (See related article on page 2709.)