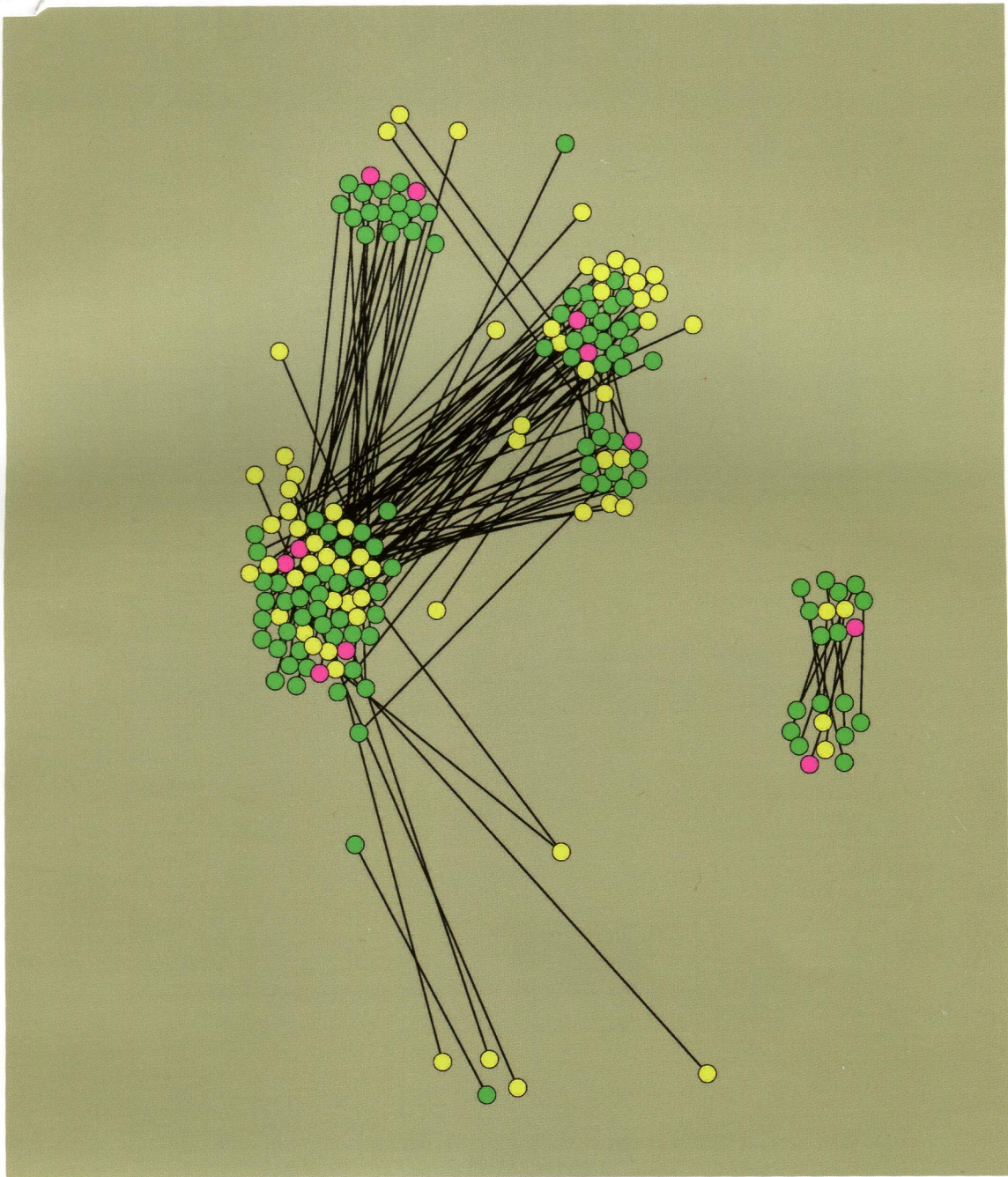


FLU
JBO/basm



October 2013
Volume 195
Number 19
Published Twice Monthly



AMERICAN
SOCIETY FOR
MICROBIOLOGY

JB

Journal of Bacteriology

TABLE OF CONTENTS

COMMENTARY

Mycobacterium tuberculosis Cholesterol Catabolism Requires a New Class of Acyl Coenzyme A Dehydrogenase

Martin I. Voskuil

4319–4321

MINIREVIEW

Interwoven Biology of the Tsetse Holobiont

Anna K. Snyder, Rita V. M. Rio

4322–4330

ARTICLES

Shrinking the FadE Proteome of *Mycobacterium tuberculosis*: Insights into Cholesterol Metabolism through Identification of an $\alpha_2\beta_2$ Heterotetrameric Acyl Coenzyme A Dehydrogenase Family

Matthew F. Wiperman, Meng Yang, Suzanne T. Thomas, Nicole S. Sampson

4331–4341

Effects of Low PBP2b Levels on Cell Morphology and Peptidoglycan Composition in *Streptococcus pneumoniae* R6

Kari Helene Berg, Gro Anita Stamsås, Daniel Straume, Leiv Sigve Håvarstein

4342–4354

Identification of a Ligand on the Wip1 Bacteriophage Highly Specific for a Receptor on *Bacillus anthracis*

Sherry Kan, Nadine Fornelos, Raymond Schuch, Vincent A. Fischetti

4355–4364

Characterization of SAV7471, a TetR-Family Transcriptional Regulator Involved in the Regulation of Coenzyme A Metabolism in *Streptomyces avermitilis*

Yanping Liu, Tingting Yan, Libin Jiang, Ying Wen, Yuan Song, Zhi Chen, Jilun Li

4365–4372

NADP-Specific Electron-Bifurcating [FeFe]-Hydrogenase in a Functional Complex with Formate Dehydrogenase in *Clostridium autoethanogenum* Grown on CO

Shuning Wang, Haiyan Huang, Jörg Kahnt, Alexander P. Mueller, Michael Köpke, Rudolf K. Thauer

4373–4386

Helicobacter pylori Salvages Purines from Extracellular Host Cell DNA Utilizing the Outer Membrane-Associated Nuclease NucT

George W. Liechti, Joanna B. Goldberg

4387–4398

Posttranslational Maturation of the Invasion Acyl Carrier Protein of *Salmonella enterica* Serovar Typhimurium Requires an Essential Phosphopantetheinyl Transferase of the Fatty Acid Biosynthesis Pathway

Julie P. M. Viala, Rémy Puppo, Lætitia My, Emmanuelle Bouveret

4399–4405

Function of a Glutamine Synthetase-Like Protein in Bacterial Aniline Oxidation via γ -Glutamylanilide

Masahiro Takeo, Akira Ohara, Shinji Sakae, Yasuhiro Okamoto, Chitoshi Kitamura, Dai-ichiro Kato, Seiji Negoro

4406–4414

Eliminating a Set of Four Penicillin Binding Proteins Triggers the Rcs Phosphorelay and Cpx Stress Responses in *Escherichia coli*

Kerry L. Evans, Suresh Kannan, Gang Li, Miguel A. de Pedro, Kevin D. Young

4415–4424

Comparative Proteome Analysis of Spontaneous Outer Membrane Vesicles and Purified Outer Membranes of *Neisseria meningitidis*

Martin Lappann, Andreas Otto, Dörte Becher, Ulrich Vogel

4425–4435

TrAG Encoded by the pIP501 Type IV Secretion System Is a Two-Domain Peptidoglycan-Degrading Enzyme Essential for Conjugative Transfer

Karsten Arends, Ertugrul-Kaan Celik, Ines Probst, Nikolaus Goessweiner-Mohr, Christian Fercher, Lukas Grumet, Cem Soellue, Mohammad Yaser Abajy, Tuerkan Sakinc, Melanie Broszat, Katarzyna Schiwon, Guenther Koraimann, Walter Keller, Elisabeth Grohmann

4436–4444

Topoisomerase I (TopA) Is Recruited to ParB Complexes and Is Required for Proper Chromosome Organization during <i>Streptomyces coelicolor</i> Sporulation	Marcin Szafran, Patrycja Skut, Bartosz Ditkowski, Katarzyna Ginda, Govind Chandra, Jolanta Zakrzewska-Czerwińska, Dagmara Jakimowicz	4445–4455
Suppressor Analysis Reveals a Role for SecY in the SecA2-Dependent Protein Export Pathway of Mycobacteria	Lauren S. Ligon, Nathan W. Rigel, Artur Romanchuk, Corbin D. Jones, Miriam Braunstein	4456–4465
New Family of Tungstate-Responsive Transcriptional Regulators in Sulfate-Reducing Bacteria	Alexey E. Kazakov, Lara Rajeev, Eric G. Luning, Grant M. Zane, Kavya Siddartha, Dmitry A. Rodionov, Inna Dubchak, Adam P. Arkin, Judy D. Wall, Aindrila Mukhopadhyay, Pavel S. Novichkov	4466–4475
<i>In Vitro</i> Evolution of an Archetypal Enteropathogenic <i>Escherichia coli</i> Strain	Shahista Nisa, Tracy H. Hazen, Lillian Assatourian, Jean-Philippe Nougayrède, David A. Rasko, Michael S. Donnenberg	4476–4483
Pilin and Sortase Residues Critical for Endocarditis- and Biofilm-Associated Pilus Biogenesis in <i>Enterococcus faecalis</i>	Hailyn V. Nielsen, Ana L. Flores-Mireles, Andrew L. Kau, Kimberly A. Kline, Jerome S. Pinkner, Fabrice Neiers, Staffan Normark, Birgitta Henriques-Normark, Michael G. Caparon, Scott J. Hultgren	4484–4495
Identification of the Set of Genes, Including Nonannotated <i>morA</i>, under the Direct Control of ModE in <i>Escherichia coli</i>	Tatsuaki Kurata, Akira Katayama, Masakazu Hiramatsu, Yuya Kiguchi, Masamitsu Takeuchi, Tomoyuki Watanabe, Hiroshi Ogasawara, Akira Ishihama, Kaneyoshi Yamamoto	4496–4505
Trapping and Identification of Cellular Substrates of the <i>Staphylococcus aureus</i> ClpC Chaperone	Justin W. Graham, Mei G. Lei, Chia Y. Lee	4506–4516
Elucidation of the Role of Clp Protease Components in Circadian Rhythm by Genetic Deletion and Overexpression in Cyanobacteria	Keiko Imai, Yohko Kitayama, Takao Kondo	4517–4526
Diverse Functions for Six Glycosyltransferases in <i>Caulobacter crescentus</i> Cell Wall Assembly	Anastasiya A. Yakhnina, Zemer Gitai	4527–4535
ppGpp Metabolism Is Involved in Heterocyst Development in the Cyanobacterium <i>Anabaena</i> sp. Strain PCC 7120	Shao-Ran Zhang, Gui-Ming Lin, Wen-Li Chen, Li Wang, Cheng-Cai Zhang	4536–4544
Interaction of <i>Streptococcus mutans</i> YidC1 and YidC2 with Translating and Nontranslating Ribosomes	Zht Cheng Wu, Jeanine de Keyzer, Greetje A. Berrelkamp-Lahpor, Arnold J. M. Driessen	4545–4551
ERRATUM		
Elucidation of Structural and Antigenic Properties of Pneumococcal Serotype 11A, 11B, 11C, and 11F Polysaccharide Capsules	Juan J. Calix, Moon H. Nahm, Edward R. Zartler	4552

Cover photograph (Copyright © 2013, American Society for Microbiology. All Rights Reserved.): Network representing the evolutionary similarity of genes that encode $\alpha_2\beta_2$ heterotetrameric acyl-coenzyme A dehydrogenases (ACADs). Each node represents a gene from *Actinobacteria* (green) or *Proteobacteria* (yellow) that is homologous to one of 11 cholesterol-regulated ACAD genes from *Mycobacterium tuberculosis* (pink). The spacings between nodes represent evolutionary distance. In *M. tuberculosis*, two ACAD genes in a single operon encode an obligate $\alpha_2\beta_2$ heterotetramer. The lines connecting two nodes identify α and β ACAD pairs that are encoded in the same operon. The pairing of α - and β -encoding ACAD genes is conserved in both phyla. Network generated with Cytoscape 2.8.2. (See related article on page 4331.)