

APPLIED AND ENVIRONMENTAL MICROBIOLOGY

Volume 74

April 2008

No. 8

MINIREVIEW

The Ehrlich Pathway for Fusel Alcohol Production: a Century of Research on *Saccharomyces cerevisiae* Metabolism

Lucie A. Hazelwood, Jean-Marc Daran, Antonius J. A. van Maris, Jack T. Pronk, and J. Richard Dickinson 2259-2266

ENZYMOLGY AND PROTEIN ENGINEERING

Characterization of an Endo- β -1,6-Galactanase from *Streptomyces avermitilis* NBRC14893

Hitomi Ichinose, Toshihisa Kotake, Yoichi Tsumuraya, and Satoshi Kaneko 2379-2383

PHYSIOLOGY AND BIOTECHNOLOGY

Solvent Stress Response of the Denitrifying Bacterium "*Aromatoleum aromaticum*" Strain EbN1

Kathleen Trautwein, Simon Kühner, Lars Wöhlbrand, Thomas Halder, Kenny Kuchta, Alexander Steinbüchel, and Ralf Rabus 2267-2274

The Genomes of the Non-Clearing-Zone-Forming and Natural-Rubber-Degrading Species *Gordonia polyisoprenivorans* and *Gordonia westfalica* Harbor Genes Expressing Lcp Activity in *Streptomyces* Strains

Daniel Bröker, David Dietz, Matthias Arenskötter, and Alexander Steinbüchel 2288-2297

Differential Selectivity of the *Escherichia coli* Cell Membrane Shifts the Equilibrium for the Enzyme-Catalyzed Isomerization of Galactose to Tagatose

Jin-Ha Kim, Byung-Chul Lim, Soo-Jin Yeom, Yeong-Su Kim, Hye-Jung Kim, Jung-Kul Lee, Sook-Hee Lee, Seon-Won Kim, and Deok-Kun Oh 2307-2313

Role of Ureolytic Activity in *Bacillus cereus* Nitrogen Metabolism and Acid Survival

Maarten Mols and Tjakko Abee 2370-2378

Polysaccharides Cellulose, Poly- β -1,6-*N*-Acetyl-D-Glucosamine, and Colanic Acid Are Required for Optimal Binding of *Escherichia coli* O157:H7 Strains to Alfalfa Sprouts and K-12 Strains to Plastic but Not for Binding to Epithelial Cells

Ann G. Matthyse, Rajendar Deora, Meenu Mishra, and Alfredo G. Torres 2384-2390

Effects of Carbon Dioxide on Neurotoxin Gene Expression in Nonproteolytic *Clostridium botulinum* Type E

Ingrid Artin, Andrew T. Carter, Elisabet Holst, Maria Lövenklev, David R. Mason, Michael W. Peck, and Peter Rådström 2391-2397

Optical Tweezers Cause Physiological Damage to *Escherichia coli* and *Listeria* Bacteria

M. B. Rasmussen, L. B. Oddershede, and H. Siegmundfeldt 2441-2446

Physiological State, Growth Mode, and Oxidative Stress Play a Role in Cd(II)-Mediated Inhibition of *Nitrosomonas europaea* 19718

Kartik Chandran and Nancy G. Love 2447-2453

Responses of *Bacillus subtilis* to Hypotonic Challenges: Physiological Contributions of Mechanosensitive Channels to Cellular Survival

Tamara Hoffmann, Clara Boiangiu, Susanne Moses, and Erhard Bremer 2454-2460

Cloning and Heterologous Production of Hiracin JM79, a Sec-Dependent Bacteriocin Produced by *Enterococcus hirae* DCH5, in Lactic Acid Bacteria and *Pichia pastoris*

Jorge Sánchez, Juan Borrero, Beatriz Gómez-Sala, Antonio Basanta, Carmen Herranz, Luis M. Cintas, and Pablo E. Hernández 2471-2479

Continued on following page

MYCOLOGY

- Molecular Characterization of New Natural Hybrids of *Saccharomyces cerevisiae* and *S. kudriavzevii* in Brewing
Alignment of Genetic and Physical Maps of *Gibberella zeae*

- Sara S. González, Eladio Barrio, and Amparo Querol 2314-2320
Jungkwan Lee, James E. Jurgenson, John F. Leslie, and Robert L. Bowden 2349-2359

PUBLIC HEALTH MICROBIOLOGY

- Multiphasic Approach Reveals Genetic Diversity of Environmental and Patient Isolates of *Mycobacterium mucogenicum* and *Mycobacterium phocaicum* Associated with an Outbreak of Bacteremias at a Texas Hospital

- Robert C. Cooksey, Michael A. Jung, Mitchell A. Yakrus, W. Ray Butler, Toidi Adékambi, Glenn P. Morlock, Margaret Williams, Alicia M. Shams, Bette J. Jensen, Roger E. Morey, Nadege Charles, Sean R. Toney, Kenneth C. Jost, Jr., Denise F. Dunbar, Vickie Bennett, Marcella Kuan, and Arjun Srinivasan 2480-2487

- Interactions between Food-Borne Pathogens and Protozoa Isolated from Lettuce and Spinach

- Poornima Gourabathini, Maria T. Brandl, Katherine S. Redding, John H. Gunderson, and Sharon G. Berk 2518-2525

- Species-Specific Identification of Campylobacters by PCR-Restriction Fragment Length Polymorphism and PCR Targeting of the Gyrase B Gene

- Susumu Kawasaki, Pina M. Fratamico, Irene V. Wesley, and Shinichi Kawamoto 2529-2533

- Tracing of Norovirus Outbreak Strains in Mussels Collected near Sewage Effluents

- Nancy P. Nenonen, Charles Hannoun, Peter Horal, Bodil Hernroth, and Tomas Bergström 2544-2549

ENVIRONMENTAL MICROBIOLOGY

- Monolayer Adsorption of a "Bald" Mutant of the Highly Adhesive and Hydrophobic Bacterium *Acinetobacter* sp. Strain Tol 5 to a Hydrocarbon Surface

- Katsutoshi Hori, Hisami Watanabe, Shun'ichi Ishii, Yasunori Tanji, and Hajime Unno 2511-2517

MICROBIAL ECOLOGY

- Identification of Siderophore Biosynthesis Genes Essential for Growth of *Aeromonas salmonicida* under Iron Limitation Conditions

- Mohsen Najimi, Manuel L. Lemos, and Carlos R. Osorio 2341-2348

- Gene Expression by the Sulfate-Reducing Bacterium *Desulfovibrio vulgaris* Hildenborough Grown on an Iron Electrode under Cathodic Protection Conditions

- Sean M. Caffrey, Hyung Soo Park, Jenny Been, Paul Gordon, Christoph W. Sensen, and Gerrit Voordouw 2404-2413

- Methane-Producing Microbial Community in a Coal Bed of the Illinois Basin

- Dariusz Strąpoć, Flynn W. Picardal, Courtney Turich, Irene Schaperdoth, Jennifer L. Macalady, Julius S. Lipp, Yu-Shih Lin, Tobias F. Ertefai, Florence Schubotz, Kai-Uwe Hinrichs, Maria Mastalerz, and Arndt Schimmelmann 2424-2432

- Intact Membrane Lipids of "*Candidatus Nitrosopumilus maritimus*," a Cultivated Representative of the Cosmopolitan Mesophilic Group I Crenarchaeota

- Stefan Schouten, Ellen C. Hopmans, Marianne Baas, Henry Boumann, Sonja Standfest, Martin Könneke, David A. Stahl, and Jaap S. Sinninghe Damsté 2433-2440

- Temporal and Spatial Patterns of Eukaryotic and Bacterial Communities Found in Vernal Pools

- Sarah R. Carrino-Kyker and Andrew K. Swanson 2554-2557

FOOD MICROBIOLOGY

Leaf Age as a Risk Factor in Contamination of Lettuce with *Escherichia coli* O157:H7 and *Salmonella enterica*

Development of a Strain-Specific Molecular Method for Quantitating Individual *Campylobacter* Strains in Mixed Populations

Taxonomic Structure and Stability of the Bacterial Community in Belgian Sourdough Ecosystems as Assessed by Culture and Population Fingerprinting

Indirect Transmission of *Escherichia coli* O157:H7 Occurs Readily among Swine but Not among Sheep

Single-Cell and Population Lag Times as a Function of Cell Age

Development of a Novel Screening Method for the Isolation of "*Cronobacter*" spp. (*Enterobacter sakazakii*)

M. T. Brandl and R. Amundson 2298-2306

Karen T. Elvers, Christopher R. Helps, Trudy M. Wassenaar, Vivien M. Allen, and Diane G. Newell 2321-2331

Ilse Scheirlinck, Roel Van der Meulen, Ann Van Schoor, Marc Vancanneyt, Luc De Vuyst, Peter Vandamme, and Geert Huys 2414-2423

Nancy A. Cornick and Hung VuKhac 2488-2491

Carmen Pin and József Baranyi 2534-2536

Carol Iversen, Patrick Druggan, Sandra Schumacher, Angelika Lehner, Claudia Feer, Karl Gschwend, Han Joosten, and Roger Stephan 2550-2553

PLANT MICROBIOLOGY

Requirement of a Plasmid-Encoded Catalase for Survival of *Rhizobium etli* CFN42 in a Polyphenol-Rich Environment

1-Aminocyclopropane-1-Carboxylate Deaminase Enhances *Agrobacterium tumefaciens*-Mediated Gene Transfer into Plant Cells

Alejandro García-de los Santos, Erika López, Ciro A. Cubillas, K. Dale Noel, Susana Brom, and David Romero 2398-2403

Satoko Nonaka, Masayuki Sugawara, Kiwamu Minamisawa, Ken-ichi Yuhashi, and Hiroshi Ezura 2526-2528

INVERTEBRATE MICROBIOLOGY

Cell Invasion and Matricide during *Photorhabdus luminescens* Transmission by *Heterorhabditis bacteriophora* Nematodes

Todd A. Ciche, Kwi-suk Kim, Bettina Kaufmann-Daszczuk, Ken C. Q. Nguyen, and David H. Hall 2275-2287

METHODS

Critical Evaluation of Two Primers Commonly Used for Amplification of Bacterial 16S rRNA Genes

Real-Time PCR Approach for Detection of Environmental Sources of *Campylobacter* Strains Colonizing Broiler Flocks

Improved Methodology for Identification of Protists and Microalgae from Plankton Samples Preserved in Lugol's Iodine Solution: Combining Microscopic Analysis with Single-Cell PCR

Removal of Free Extracellular DNA from Environmental Samples by Ethidium Monoazide and Propidium Monoazide

Removal of Odors from Swine Wastewater by Using Microbial Fuel Cells

Jeremy A. Frank, Claudia I. Reich, Shobha Sharma, Jon S. Weisbaum, Brenda A. Wilson, and Gary J. Olsen 2461-2470

Anne M. Ridley, Vivien M. Allen, Meenaxi Sharma, Jill A. Harris, and Diane G. Newell 2492-2504

Barbara M. Auinger, Karin Pfandl, and Jens Boenigk 2505-2510

Andreas O. Wagner, Cornelia Malin, Brigitte A. Knapp, and Paul Illmer 2537-2539

Jung Rae Kim, Jerzy Dec, Mary Ann Bruns, and Bruce E. Logan 2540-2543

BIODEGRADATION

Rapid Mineralization of the Phenylurea Herbicide Diuron by *Variovorax* sp. Strain SRS16 in Pure Culture and within a Two-Member Consortium

Sebastian R. Sørensen, Christian N. Albers, and Jens Aamand 2332–2340

EVOLUTIONARY AND GENOMIC MICROBIOLOGY

Evolution of the *iss* Gene in *Escherichia coli*

Timothy J. Johnson, Yvonne M. Wannemuehler, and Lisa K. Nolan 2360–2369

ERRATUM

Characterization of Airborne Molds, Endotoxins, and Glucans in Homes in New Orleans after Hurricanes Katrina and Rita

Carol Y. Rao, Margaret A. Riggs, Ginger L. Chew, Michael L. Muilenberg, Peter S. Thorne, David Van Sickle, Kevin H. Dunn, and Clive Brown 2558

Cover photograph (Copyright © 2008, American Society for Microbiology. All Rights Reserved.): Symbiont discrimination in a nematode intestine. Shown is the insect-parasitic nematode *Heterorhabditis bacteriophora* containing transient *Escherichia coli* cells (green) and a biofilm of symbiotic *Photobacterium temperata* cells (red). Only cells that form a biofilm on the posterior intestine persist to later invade the rectal gland cells before being released to nematode offspring developing inside the maternal body cavity. (See related article on page 2275.)