

APPLIED AND ENVIRONMENTAL MICROBIOLOGY

Volume 75

April 2009

No. 8

BIOTECHNOLOGY

- Functional Expression of a Bacterial Xylose Isomerase in *Saccharomyces cerevisiae*** Dawid Brat, Eckhard Boles, and Beate Wiedemann 2304–2311
- Catalase Overexpression Reduces Lactic Acid-Induced Oxidative Stress in *Saccharomyces cerevisiae*** Derek A. Abbott, Erwin Suir, Giang-Huong Duong, Erik de Hulster, Jack T. Pronk, and Antonius J. A. van Maris 2320–2325
- Cellulase Production from Spent Lignocellulose Hydrolysates by Recombinant *Aspergillus niger*** Björn Alriksson, Shaunita H. Rose, Willem H. van Zyl, Anders Sjöde, Nils-Olof Nilvebrant, and Leif J. Jönsson 2366–2374
- Development of Bacteriocinogenic Strains of *Saccharomyces cerevisiae* Heterologously Expressing and Secreting the Leaderless Enterocin L50 Peptides L50A and L50B from *Enterococcus faecium* L50** Antonio Basanta, Carmen Herranz, Jorge Gutiérrez, Raquel Criado, Pablo E. Hernández, and Luis M. Cintas 2382–2392
- Fermentative Production of Thymidine by a Metabolically Engineered *Escherichia coli* Strain** Hyeon Cheol Lee, Jin Ha Kim, Jin Sook Kim, Wonhee Jang, and Sang Yong Kim 2423–2432

ENVIRONMENTAL MICROBIOLOGY

- A Novel *Dehalobacter* Species Is Involved in Extensive 4,5,6,7-Tetrachlorophthalide Dechlorination** Naoko Yoshida, Lizhen Ye, Daisuke Baba, and Arata Katayama 2400–2405
- Periplasmic *c* Cytochromes and Chlorate Reduction in *Ideonella dechloratans*** Anna Smedja Bäcklund, Jan Bohlin, Niklas Gustavsson, and Thomas Nilsson 2439–2445
- Filamentous Bacterium Eikelboom Type 0092 in Activated Sludge Plants in Australia Is a Member of the Phylum *Chloroflexi*** Lachlan Speirs, Tadashi Nittami, Simon McIlroy, Sarah Schroeder, and Robert J. Seviour 2446–2452
- Effect of Biowaste Sludge Maturation on the Diversity of Thermophilic Bacteria and Archaea in an Anaerobic Reactor** M. Goberna, H. Insam, and I. H. Franke-Whittle 2566–2572

ENZYMOLGY AND PROTEIN ENGINEERING

- Isolation and Characterization of Metalloproteases with a Novel Domain Structure by Construction and Screening of Metagenomic Libraries** Tanja Waschowitz, Stephanie Rockstroh, and Rolf Daniel 2506–2516

EVOLUTIONARY AND GENOMIC MICROBIOLOGY

- Chimeric Genomes of Natural Hybrids of *Saccharomyces cerevisiae* and *Saccharomyces kudriavzevii*** Carmela Belloch, Roberto Pérez-Torrado, Sara S. González, José E. Pérez-Ortín, José García-Martínez, Amparo Querol, and Eladio Barrio 2534–2544

FOOD MICROBIOLOGY

- Succession of Selected Strains of *Acetobacter pasteurianus* and Other Acetic Acid Bacteria in Traditional Balsamic Vinegar** Maria Gullo, Luciana De Vero, and Paolo Giudici 2585–2589
- Dynamic Model of Heat Inactivation Kinetics for Bacterial Adaptation** Maria G. Corradini and Micha Peleg 2590–2597

Continued on following page

GENETICS AND MOLECULAR BIOLOGY

Characterization of a β -Glucoside Operon (*bgc*) Prevalent in Septicemic and Uropathogenic *Escherichia coli* Strains

Girish Neelakanta, T. Sabari Sankar, and Karin Schnetz 2284-2293

Temperature-Dependent Phage Resistance of *Listeria monocytogenes* Epidemic Clone II

Jae-Won Kim and Sophia Kathariou 2433-2438

Identification and Characterization of the Phage Gene *sav*, Involved in Sensitivity to the Lactococcal Abortive Infection Mechanism AbiV

Jakob Haaber, Geneviève M. Rousseau, Karin Hammer, and Sylvain Moineau 2484-2494

GEOMICROBIOLOGY

Microbial Mineral Weathering for Nutrient Acquisition Releases Arsenic

Brian J. Mailloux, Ekaterina Alexandrova, Alison R. Keimowitz, Karen Wovkulich, Greg A. Freyer, Michael Herron, John F. Stolz, Timothy C. Kenna, Thomas Pichler, Matthew L. Polizzotto, Hailiang Dong, Michael Bishop, and Peter S. K. Knappett 2558-2565

INVERTEBRATE MICROBIOLOGY

Climate and Tick Seasonality Are Predictors of *Borrelia burgdorferi* Genotype Distribution

Anne G. Gatewood, Kelly A. Liebman, Gwenaél Vourc'h, Jonas Bunikis, Sarah A. Hamer, Roberto Cortinas, Forrest Melton, Paul Cislo, Uriel Kitron, Jean Tsao, Alan G. Barbour, Durland Fish, and Maria A. Diuk-Wasser 2476-2483

Effect of Temperature on the Biotic Potential of Honeybee Microsporidia

Raquel Martín-Hernández, Aránzazu Meana, Pilar García-Palencia, Pilar Marín, Cristina Botías, Encarna Garrido-Bailón, Laura Barrios, and Mariano Higes 2554-2557

METHODS

New Electropositive Filter for Concentrating Enteroviruses and Noroviruses from Large Volumes of Water

Mohammad R. Karim, Eric R. Rhodes, Nichole Brinkman, Larry Wymer, and G. Shay Fout 2393-2399

Time-Resolved Metabolic Footprinting for Nonlinear Modeling of Bacterial Substrate Utilization

Volker Behrends, Tim M. D. Ebbels, Huw D. Williams, and Jacob G. Bundy 2453-2463

Quantitative Community Fingerprinting Methods for Estimating the Abundance of Operational Taxonomic Units in Natural Microbial Communities

Alban Ramette 2495-2505

Hierarchical Oligonucleotide Primer Extension as a Time- and Cost-Effective Approach for Quantitative Determination of *Bifidobacterium* spp. in Infant Feces

Pei-Ying Hong, Gaik Chin Yap, Bee Wah Lee, Kaw Yan Chua, and Wen-Tso Liu 2573-2576

MICROBIAL ECOLOGY

Seasonal Dynamics and Metagenomic Characterization of Estuarine Viriobenthos Assemblages by Randomly Amplified Polymorphic DNA PCR

Rebekah R. Helton and K. Eric Wommack 2259-2265

Culture-Independent Characterization of Bacterial Communities Associated with the Cold-Water Coral *Lophelia pertusa* in the Northeastern Gulf of Mexico

Christina A. Kellogg, John T. Lisle, and Julia P. Galkiewicz 2294-2303

Isolation and Characterization of a Single-Stranded RNA Virus Infecting the Bloom-Forming Diatom *Chaetoceros socialis*

Stimulation of Expression of a Silica-Induced Protein (Sip) in *Thermus thermophilus* by Supersaturated Silicic Acid

Formation of Multilayered Photosynthetic Biofilms in an Alkaline Thermal Spring in Yellowstone National Park, Wyoming

Effect of Freezing on PCR Amplification of 16S rRNA Genes from Microbes Associated with Black Band Disease of Corals

Community Composition and Density of Methanogens in the Foregut of the Tammar Wallaby (*Macropus eugenii*)

Yuji Tomaru, Yoshitake Takao, Hidekazu Suzuki, Tamotsu Nagumo, and Keizo Nagasaki 2375-2381

Katsumi Doi, Yasuhiro Fujino, Fumio Inagaki, Ryouichi Kawatsu, Miki Tahara, Toshihisa Ohshima, Yoshihiro Okaue, Takushi Yokoyama, Satoru Iwai, and Seiya Ogata 2406-2413

Sarah M. Boomer, Katherine L. Noll, Gill G. Geesey, and Bryan E. Dutton 2464-2475

Raju Sekar, Longin T. Kaczmarek, and Laurie L. Richardson 2581-2584

Paul N. Evans, Lyn A. Hinds, Lindsay I. Sly, Christopher S. McSweeney, Mark Morrison, and André-Denis G. Wright 2598-2602

MYCOLOGY

Different Patterns of Regulation for the Copper and Cadmium Metallothioneins of the Ectomycorrhizal Fungus *Hebeloma cylindrosporum*

Analysis of Variance Components Reveals the Contribution of Sample Processing to Transcript Variation

Antibody-Mediated Immobilization of *Cryptococcus neoformans* Promotes Biofilm Formation

Use of Calcofluor White for Detection, Identification, and Quantification of Phytoplanktonic Fungal Parasites

G. Ramesh, G. K. Podila, G. Gay, R. Marmesse, and M. S. Reddy 2266-2274

Douwe van der Veen, José Miguel Oliveira, Willy A. M. van den Berg, and Leo H. de Graaff 2414-2422

Emma J. Robertson and Arturo Casadevall 2528-2533

Serena Rasconi, Marlène Jobard, Lionel Jouve, and Télésphore Sime-Ngando 2545-2553

PHYSIOLOGY

Production of the Phytohormone Indole-3-Acetic Acid by Estuarine Species of the Genus *Vibrio*

Coculture Fermentations of *Bifidobacterium* Species and *Bacteroides thetaiotaomicron* Reveal a Mechanistic Insight into the Prebiotic Effect of Inulin-Type Fructans

Heterologous Production of Methionine- γ -Lyase from *Brevibacterium linens* in *Lactococcus lactis* and Formation of Volatile Sulfur Compounds

Improved Fermentation Performance of a Lager Yeast after Repair of Its *AGT1* Maltose and Maltotriose Transporter Genes

Variation in Bacterial ATP Level and Proton Motive Force Due to Adhesion to a Solid Surface

Changes in Biochemical and Phenotypic Properties of *Streptococcus mutans* during Growth with Aeration

Cassandra K. Gutierrez, George Y. Matsui, David E. Lincoln, and Charles R. Lovell 2253-2258

Gwen Falony, Thomas Calmeyn, Frédéric Leroy, and Luc De Vuyst 2312-2319

Sean B. Hanniffy, Mark Philo, Carmen Peláez, Michael J. Gasson, Teresa Requena, and M. C. Martínez-Cuesta 2326-2332

Virve Vidgren, Anne Huuskonen, Hannele Virtanen, Laura Ruohonen, and John Londesborough 2333-2345

Yongsuk Hong and Derick G. Brown 2346-2353

Sug-Joon Ahn, Sang-Joon Ahn, Christopher M. Brownrigg, and Robert A. Burne 2517-2527

PLANT MICROBIOLOGY

Characterization of Regulatory Pathways in *Xylella fastidiosa*: Genes and Phenotypes Controlled by *gacA*

Xiang Yang Shi, C. Korsi Dumenyo, 2275–2283
Rufina Hernandez-Martinez, Hamid Azad, and Donald A. Cooksey

Rhizobia from Lanzarote, the Canary Islands, That Nodulate *Phaseolus vulgaris* Have Characteristics in Common with *Sinorhizobium meliloti* Isolates from Mainland Spain

José Luis Zurdo-Piñeiro, Paula 2354–2359
García-Fraile, Raúl Rivas, Alvaro Peix, Milagros León-Barrios, Anne Willems, Pedro Francisco Mateos, Eustoquio Martínez-Molina, Encarna Velázquez, and Peter van Berkum

PUBLIC HEALTH MICROBIOLOGY

Dogs Are a Reservoir of Ampicillin-Resistant *Enterococcus faecium* Lineages Associated with Human Infections

Peter Damborg, Janetta Top, 2360–2365
Antoni P. A. Hendrickx, Susan Dawson, Rob J. L. Willems, and Luca Guardabassi

Spontaneous Quinolone Resistance in the Zoonotic Serovar of *Vibrio vulnificus*

Francisco J. Roig, A. Llorens, B. 2577–2580
Fouz, and C. Amaro

AUTHOR'S CORRECTION

Discovery of Stable and Variable Differences in the *Mycobacterium avium* subsp. *paratuberculosis* Type I, II, and III Genomes by Pan-Genome Microarray Analysis

Elena Castellanos, Alicia Aranaz, 2603
Katherine A. Gould, Richard Linedale, Karen Stevenson, Julio Alvarez, Lucas Dominguez, Lucia de Juan, Jason Hinds, and Tim J. Bull

Cover photograph (Copyright © 2009, American Society for Microbiology. All Rights Reserved.): Fungal parasitism of phytoplankton prokaryotes in the productive Lake Aydat (Massif Central, France): calcofluor white (CFW)-stained sporangium of a parasitic chytrid (tentatively identified as *Rhizosiphon crassum*) with a typical isodiametric endobiotic thallus within the filamentous cyanobacterial host *Anabaena flosaquae*. The fluorochrome, CFW, selectively binds to the chitinous walls of fungal structures and fluoresces with an intense blue color under UV light. Photo by Serena Rasconi, Marlène Jobard, and Télésphore Sime- Ngando, Laboratoire Microorganismes: Génome & Environnement (LMGE), Aubière, France. (See related article on page 2545.)

Author Index

- Abbott, Derek A., 2320
Ahn, Sang-Joon, 2517
Ahn, Sug-Joon, 2517
Alexandrova, Ekaterina, 2558
Alriksson, Björn, 2366
Amaro, C., 2577
Azad, Hamid, 2275
- Baba, Daisuke, 2400
Barbour, Alan G., 2476
Barrio, Eladio, 2534
Barrios, Laura, 2554
Basanta, Antonio, 2382
Behrends, Volker, 2453
Belloch, Carmela, 2534
Bishop, Michael, 2558
Bohlin, Jan, 2439
Boles, Eckhard, 2304
Boomer, Sarah M., 2464
Botías, Cristina, 2554
Brat, Dawid, 2304
Brinkman, Nichole, 2393
Brown, Derick G., 2346
Browningard, Christopher M., 2517
Bundy, Jacob G., 2453
Bunikis, Jonas, 2476
Burne, Robert A., 2517
- Calmeyn, Thomas, 2312
Casadevall, Arturo, 2528
Chua, Kaw Yan, 2573
Cintas, Luis M., 2382
Cislo, Paul, 2476
Cooksey, Donald A., 2275
Corradini, Maria G., 2590
Cortinas, Roberto, 2476
Criado, Raquel, 2382
- Damborg, Peter, 2360
Daniel, Rolf, 2506
Dawson, Susan, 2360
de Graaff, Leo H., 2414
de Hulster, Erik, 2320
De Vero, Luciana, 2585
De Vuyst, Luc, 2312
Diuk-Wasser, Maria A., 2476
Doi, Katsumi, 2406
Dong, Hailiang, 2558
Dumenyo, C. Korsi, 2275
Duong, Giang-Huong, 2320
Dutton, Bryan E., 2464
- Ebbels, Tim M. D., 2453
Evans, Paul N., 2598
- Falony, Gwen, 2312
Fish, Durland, 2476
Fout, G. Shay, 2393
Fouz, B., 2577
Franke-Whittle, I. H., 2566
- Freyer, Greg A., 2558
Fujino, Yasuhiro, 2406
- Galkiewicz, Julia P., 2294
García-Fraile, Paula, 2354
García-Martínez, José, 2534
García-Palencia, Pilar, 2554
Garrido-Bailón, Encarna, 2554
Gasson, Michael J., 2326
Gatewood, Anne G., 2476
Gay, G., 2266
Geesey, Gill G., 2464
Giudici, Paolo, 2585
Goberna, M., 2566
González, Sara S., 2534
Guardabassi, Luca, 2360
Gullo, Maria, 2585
Gustavsson, Niklas, 2439
Gutierrez, Casandra K., 2253
Gutiérrez, Jorge, 2382
- Haaber, Jakob, 2484
Hamer, Sarah A., 2476
Hammer, Karin, 2484
Hanniffy, Sean B., 2326
Helton, Rebekah R., 2259
Hendrickx, Antoni P. A., 2360
Hernández, Pablo E., 2382
Hernandez-Martinez, Rufina, 2275
Herranz, Carmen, 2382
Herron, Michael, 2558
Higes, Mariano, 2554
Hinds, Lyn A., 2598
Hong, Pei-Ying, 2573
Hong, Yongsuk, 2346
Huuskonen, Anne, 2333
- Inagaki, Fumio, 2406
Insam, H., 2566
Iwai, Satoru, 2406
- Jang, Wonhee, 2423
Jobard, Marlène, 2545
Jönsson, Leif J., 2366
Jouve, Lionel, 2545
- Kaczmarek, Longin T., 2581
Karim, Mohammad R., 2393
Katayama, Arata, 2400
Kathariou, Sophia, 2433
Kawatsu, Ryouichi, 2406
Keimowitz, Alison R., 2558
Kellogg, Christina A., 2294
Kenna, Timothy C., 2558
Kim, Jae-Won, 2433
Kim, Jin Ha, 2423
Kim, Jin Sook, 2423
Kim, Sang Yong, 2423
Kitron, Uriel, 2476
Knappett, Peter S. K., 2558
- Lee, Bee Wah, 2573
Lee, Hyeon Cheol, 2423
León-Barrios, Milagros, 2354
Leroy, Frédéric, 2312
Liebman, Kelly A., 2476
Lincoln, David E., 2253
Lisle, John T., 2294
Liu, Wen-Tso, 2573
Llorens, A., 2577
Londesborough, John, 2333
Lovell, Charles R., 2253
- Mailloux, Brian J., 2558
Marín, Pilar, 2554
Marmesse, R., 2266
Martínez-Cuesta, M. C., 2326
Martínez-Molina, Eustoquio, 2354
Martín-Hernández, Raquel, 2554
Mateos, Pedro Francisco, 2354
Matsui, George Y., 2253
McIlroy, Simon, 2446
McSweeney, Christopher S., 2598
Meana, Aránzazu, 2554
Melton, Forrest, 2476
Moineau, Sylvain, 2484
Morrison, Mark, 2598
- Nagasaki, Keizo, 2375
Nagumo, Tamotsu, 2375
Neelakanta, Girish, 2284
Nilsson, Thomas, 2439
Nilvebrant, Nils-Olof, 2366
Nittami, Tadashi, 2446
Noll, Katherine L., 2464
- Ogata, Seiya, 2406
Ohshima, Toshihisa, 2406
Okaue, Yoshihiro, 2406
Oliveira, José Miguel, 2414
- Peix, Alvaro, 2354
Peláez, Carmen, 2326
Peleg, Micha, 2590
Pérez-Ortín, José E., 2534
Pérez-Torrado, Roberto, 2534
Philo, Mark, 2326
Pichler, Thomas, 2558
Podila, G. K., 2266
Polizzotto, Matthew L., 2558
Pronk, Jack T., 2320
- Querol, Amparo, 2534
- Ramesh, G., 2266
Ramette, Alban, 2495
Rasconi, Serena, 2545
Reddy, M. S., 2266
Requena, Teresa, 2326
- Rhodes, Eric R., 2393
Richardson, Laurie L., 2581
Rivas, Raúl, 2354
Robertson, Emma J., 2528
Rockstroh, Stephanie, 2506
Roig, Francisco J., 2577
Rose, Shaunita H., 2366
Rousseau, Geneviève M., 2484
Ruohonen, Laura, 2333
- Sankar, T. Sabari, 2284
Schnetz, Karin, 2284
Schroeder, Sarah, 2446
Sekar, Raju, 2581
Seviour, Robert J., 2446
Shi, Xiang Yang, 2275
Sime-Ngando, Télesphore, 2545
Sjöde, Anders, 2366
Sly, Lindsay I., 2598
Smedja Bäcklund, Anna, 2439
Speirs, Lachlan, 2446
Stolz, John F., 2558
Suir, Erwin, 2320
Suzuki, Hidekazu, 2375
- Tahara, Miki, 2406
Takao, Yoshitake, 2375
Tomaru, Yuji, 2375
Top, Janetta, 2360
Tsao, Jean, 2476
- van Berkum, Peter, 2354
van den Berg, Willy A. M., 2414
van der Veen, Douwe, 2414
van Maris, Antonius J. A., 2320
van Zyl, Willem H., 2366
Velázquez, Encarna, 2354
Vidgren, Virve, 2333
Virtanen, Hannele, 2333
Vourc'h, Gwenaél, 2476
- Waschkowitz, Tanja, 2506
Wiedemann, Beate, 2304
Willems, Anne, 2354
Willems, Rob J. L., 2360
Williams, Huw D., 2453
Wommack, K. Eric, 2259
Wovkulich, Karen, 2558
Wright, André-Denis G., 2598
Wymer, Larry, 2393
- Yap, Gaik Chin, 2573
Ye, Lizhen, 2400
Yokoyama, Takushi, 2406
Yoshida, Naoko, 2400
- Zurdo-Piñeiro, José Luis, 2354