

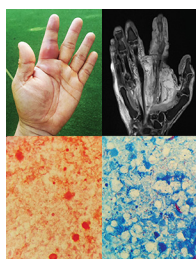


AMERICAN  
SOCIETY FOR  
MICROBIOLOGY

Journal of  
Clinical Microbiology®

## CONTENTS • APRIL 2020 • VOLUME 58, NO. 4

### COVER IMAGE



Cover photograph: See Photo Quiz at e02058-18. (Copyright © 2020 American Society for Microbiology. All Rights Reserved.)

### PHOTO QUIZ

**Photo Quiz: A 53-Year-Old Thai Man with Progressive Swelling of the Left Index Finger** e02058-18

*Piyaporn Chokevittaya, Anucha Apisarnthanarak, Siriththin Chansirikarnjana, Chinnakart Boonyasirikool, Jutatip Kintarak, David J. Weber*

**Answer to Photo Quiz** e02059-18

*Piyaporn Chokevittaya, Anucha Apisarnthanarak, Siriththin Chansirikarnjana, Chinnakart Boonyasirikool, Jutatip Kintarak, David J. Weber*

### THE BRIEF CASE

**The Brief Case: IMP, the Uncommonly Common Carbapenemase** e01094-19

*Christopher F. Lowe, Nancy Matic, Sylvie Champagne, Marc G. Romney, Victor Leung, Gordon Ritchie*

**Closing the Brief Case: IMP, the Uncommonly Common Carbapenemase** e01126-19

*Christopher F. Lowe, Nancy Matic, Sylvie Champagne, Marc G. Romney, Victor Leung, Gordon Ritchie*

### COMMENTARIES

**Machine Learning Takes Laboratory Automation to the Next Level** e00012-20

*Bradley A. Ford, Erin McElvania*

**Use of Rapid Diagnostics To Manage Pediatric Bloodstream Infections? You Bet Your ASP!** e02082-19

*Mark D. Gonzalez, Melanie L. Yarbrough*

**Analysis of a *Candida auris* Outbreak Provides New Insights into an Emerging Pathogen** e02083-19

*Brian L. Wickes*

### MINIREVIEWS

**Diagnostic Mycology: Xtreme Challenges** e01345-19

*Brian L. Wickes, Anna M. Romanelli*

- Expanding U.S. Laboratory Capacity for *Neisseria gonorrhoeae* Antimicrobial Susceptibility Testing and Whole-Genome Sequencing through the CDC's Antibiotic Resistance Laboratory Network** e01461-19  
*Ellen N. Kersh, Cau D. Pham, John R. Papp, Robert Myers, Richard Steece, Grace Kubin, Romesh Gautam, Evelyn E. Nash, Samera Sharpe, Kim M. Gernert, Matthew Schmerer, Brian H. Raphael, Tara Henning, Anne M. Gaynor, Olusegun Soge, Karen Schlanger, Robert D. Kirkcaldy, Sancta B. St. Cyr, Elizabeth A. Torrone, Kyle Bernstein, Hillard Weinstock, the AR-Ng Working Group*
- Diagnostic Testing for Crimean-Congo Hemorrhagic Fever** e01580-19  
*Vanessa N. Raabe*
- BACTERIOLOGY**
- Impact of a Rapid Blood Culture Diagnostic Test in a Children's Hospital Depends on Gram-Positive versus Gram-Negative Organism and Day versus Night Shift** e01400-19  
*Lillian J. Juttukonda, Sophie Katz, Jessica Gillon, Jonathon Schmitz, Ritu Banerjee*
- Differentiation of *Francisella tularensis* Subspecies and Subtypes** e01495-19  
*Marilynn A. Larson, Khalid Sayood, Amanda M. Bartling, Jennifer R. Meyer, Clarise Starr, James Baldwin, Michael P. Dempsey*
- Evaluation of the WASPLab Segregation Software To Automatically Analyze Urine Cultures Using Routine Blood and MacConkey Agars** e01683-19  
*Matthew L. Faron, Blake W. Buchan, Ryan F. Relich, James Clark, Nathan A. Ledebor*
- Clinical Performance of the Novel GenMark Dx ePlex Blood Culture ID Gram-Positive Panel** e01730-19  
*Karen C. Carroll, Jennifer L. Reid, Adam Thornberg, Natalie N. Whitfield, Deirdre Trainor, Shawna Lewis, Teresa Wakefield, Thomas E. Davis, Keisha G. Church, Linoj Samuel, Ray Mills, Patricia Jim, Stephen Young, Frederick S. Nolte*
- Correlation between Broth Microdilution and Disk Diffusion Results when Testing Ceftazidime-Avibactam against a Challenge Collection of *Enterobacteriales* Isolates: Results from a Multilaboratory Study** e01757-19  
*Helio S. Sader, Paul R. Rhomberg, Sukantha Chandrasekaran, Marisol Trejo, Kelley A. Fedler, Linda D. Boyken, Daniel J. Diekema*
- Diagnostic Accuracy of a Noninvasive Test for Detection of *Helicobacter pylori* and Resistance to Clarithromycin in Stool by the Amplidiag *H. pylori*+ClariR Real-Time PCR Assay** e01787-19  
*Maxime Pichon, Benoit Pichard, Thierry Barrioz, Chloé Plouzeau, Vincent Croquet, Ginette Fotsing, Alexandre Chéron, Éric Vuillemin, Marc Wangermez, Paul-Arthur Haineaux, Philippe Vasseur, Quentin Thiebault, Clémence Lefèvre, Anaïs de Singly, Julie Cremniter, Lauranne Broutin, Anthony Michaud, Christine Silvain, Christophe Burucoa*
- Evaluation of the NG-Test MCR-1 Lateral Flow Assay and EDTA-Colistin Broth Disk Elution Methods To Detect Plasmid-Mediated Colistin Resistance among Gram-Negative Bacterial Isolates** e01823-19  
*Alexander J. Fenwick, Yehudit Bergman, Shawna Lewis, Rebecca Yee, Anne-Catrin Uhlemann, Nicolynn Cole, Peggy Kohner, Carly Ordak, Daniel A. Green, Audrey N. Schuetz, Romney Humphries, Patricia J. Simner*

- Evaluation of the Revogene Carba C Assay for Detection and Differentiation of Carbapenemase-Producing Gram-Negative Bacteria** e01927-19  
*Delphine Girlich, Marine Laguide, Laurent Dortet, Thierry Naas*
- Validation of Aztreonam-Avibactam Susceptibility Testing Using Digitally Dispensed Custom Panels** e01944-19  
*Eric Ransom, Amelia Bhatnagar, Jean B. Patel, Maria-Jose Machado, Sandra Boyd, Natashia Reese, Joseph D. Lutgring, David Lonsway, Karen Anderson, Allison C. Brown, Christopher A. Elkins, J. Kamile Rasheed, Maria Karlsson*
- Reduced *In Vitro* Susceptibility of *Streptococcus pyogenes* to  $\beta$ -Lactam Antibiotics Associated with Mutations in the *pbp2x* Gene Is Geographically Widespread** e01993-19  
*James M. Musser, Stephen B. Beres, Luchang Zhu, Randall J. Olsen, Jaana Vuopio, Hanne-Leena Hyyryläinen, Kirsi Gröndahl-Yli-Hannuksela, Karl G. Kristinsson, Jessica Darenberg, Birgitta Henriques-Normark, Steen Hoffmann, Dominique A. Caugant, Andrew J. Smith, Diane S. J. Lindsay, David M. Boragine, Timothy Palzkill*
- MYCOBACTERIOLOGY AND AEROBIC ACTINOMYCETES**
- Fast, Simple, and Cheap: the Kudoh-Ogawa Swab Method as an Alternative to the Petroff–Lowenstein-Jensen Method for Culturing of *Mycobacterium tuberculosis*** e01424-19  
*Greta Franco-Sotomayor, Ismar A. Rivera-Olivero, Margarita Leon-Benitez, Sandra E. Uruchima-Campoverde, Greta Cardenas-Franco, Mercedes E. Perdomo-Castro, Camilo S. Cardenas-Franco, Jackeline Ortega-Vivanco, Ana S. Abad-Ruiz, Jacobus H. de Waard, Miguel Angel Garcia-Bereguaiain*
- Validation of Bedaquiline Phenotypic Drug Susceptibility Testing Methods and Breakpoints: a Multilaboratory, Multicountry Study** e01677-19  
*Koné Kaniga, Akio Aono, Emanuele Borroni, Daniela Maria Cirillo, Christel Desmaretz, Rumina Hasan, Lavania Joseph, Satoshi Mitarai, Sadia Shakoor, Gabriela Torrea, Nazir Ahmed Ismail, Shaheed V. Omar*
- Comparative Results of QuantiFERON-TB Gold In-Tube and QuantiFERON-TB Gold Plus Assays for Detection of Tuberculosis Infection in Clinical Samples** e01854-19  
*Dongju Won, Jung Yong Park, Hyon-Suk Kim, Younhee Park*
- MYCOLOGY**
- Direct Blood Culturing of *Candida* spp. on Solid Medium by a Rapid Enrichment Method with Magnetic Beads Coated with Recombinant Human Mannan-Binding Lectin** e00057-20  
*Xiao-Li Chen, Hao Zheng, Wen-Ge Li, You-Hong Zhong, Xiao-Ping Chen, Jin-Xing Lu*
- Laboratory Analysis of an Outbreak of *Candida auris* in New York from 2016 to 2018: Impact and Lessons Learned** e01503-19  
*YanChun Zhu, Brittany O'Brien, Lynn Leach, Alexandra Clarke, Marian Bates, Eleanor Adams, Belinda Ostrowsky, Monica Quinn, Elizabeth Dufort, Karen Southwick, Richard Erazo, Valerie B. Haley, Coralie Bucher, Vishnu Chaturvedi, Ronald J. Limberger, Debra Blog, Emily Lutterloh, Sudha Chaturvedi*
- Evaluation of Serum Cryptococcal Antigen Testing Using Two Novel Semiquantitative Lateral Flow Assays in Persons with Cryptococcal Antigenemia** e02046-19  
*Caleb Skipper, Kiiza Tadeo, Emily Martyn, Elizabeth Nalintya, Radha Rajasingham, David B. Meya, Bosco Kafufu, Joshua Rhein, David R. Boulware*

**Efficacy of Cerebrospinal Fluid Beta-D-Glucan Diagnostic Testing for Fungal Meningitis: a Systematic Review** e02094-19

*Christian Davis, L. Joseph Wheat, Thein Myint, David R. Boulware, Nathan C. Bahr*

#### VIROLOGY

**Performance of the Alethia CMV Assay for Detection of Cytomegalovirus by Use of Neonatal Saliva Swabs** e01951-19

*Soren Gantt, David M. Goldfarb, Albert Park, William Rawlinson, Suresh B. Boppana, Tiziana Lazzarotto, Lawrence M. Mertz*

#### IMMUNOASSAYS

**Performance Characteristics of a Multiplex Flow Immunoassay for Detection of IgG-Class Antibodies to Measles, Mumps, Rubella, and Varicella-Zoster Viruses in Presumptively Immune Health Care Workers** e00136-20

*Elitza S. Theel, Marisa Sorenson, Crystal Rahman, Dane Granger, Andrew Vaughn, Laura Breeher*

**High Levels of Serum Angiopoietin 2 and Angiopoietin 2/1 Ratio at the Critical Stage of Dengue Hemorrhagic Fever in Patients and Association with Clinical and Biochemical Parameters** e00436-19

*Maheshi Mapalagamage, Shiroma M. Handunnetti, Ananda Rajitha Wickremasinghe, Gayani Premawansa, Sharmila Thillainathan, Tharanga Fernando, Karunayokiny Kanapathipillai, Aruna Dharshan De Silva, Sunil Premawansa*

**Tick-Borne Encephalitis Virus Nonstructural Protein 1 IgG Enzyme-Linked Immunosorbent Assay for Differentiating Infection versus Vaccination Antibody Responses** e01783-19

*P. Girtl, M. Bestehorn-Willmann, S. Zange, J. P. Borde, G. Dobler, H. von Buttlar*

**Prospective Evaluation of the mariPOC Test for Detection of *Clostridioides difficile* Glutamate Dehydrogenase and Toxins A/B** e01872-19

*Roosa Savolainen, Juha M. Koskinen, Silja Mentula, Janne O. Koskinen, Suvi-Sirkku Kaukoranta*

#### CLINICAL VETERINARY MICROBIOLOGY

**Validation of *Bartonella henselae* Western Immunoblotting for Serodiagnosis of Bartonellosis in Dogs** e01335-19

*Pradeep Neupane, Sindhura Sevala, Nandhakumar Balakrishnan, Henry Marr, James Wilson, Ricardo Maggi, Adam Birkenheuer, Michael Lappin, Bruno Chomel, Edward B. Breitschwerdt*

#### EPIDEMIOLOGY

**Persistent Transmission of Shigellosis in England Is Associated with a Recently Emerged Multidrug-Resistant Strain of *Shigella sonnei*** e01692-19

*Megan Bardsley, Claire Jenkins, Holly D. Mitchell, Amy F. W. Mikhail, Kate S. Baker, Kirsty Foster, Gwenda Hughes, Timothy J. Dallman*

**Single-Locus-Sequence-Based Typing of the *mgpB* Gene Reveals Transmission Dynamics in *Mycoplasma genitalium*** e01886-19

*Miguel Fernández-Huerta, Judit Serra-Pladevall, Juliana Esperalba, Albert Moreno-Mingorance, Candela Fernández-Naval, María-Jesús Barberá, David Aparicio, Oscar Q. Pich, Tomàs Pumarola, Jorgen S. Jensen, Mateu Espasa*

## LETTERS TO THE EDITOR

- Evaluation of QuantiFERON-TB Gold Plus on Liaison XL in a Low-Tuberculosis-Incidence Setting** e00159-20  
*E. De Maertelaere, S. Vandendriessche, B. Verhasselt, L. Coorevits, E. André, E. Padalko, J. Boelens*
- Actual Clinical Practice Related to Contaminated Blood Cultures May Limit the Cost Savings Associated with Interventions To Reduce Contamination Rates** e01796-19  
*David Terrero Salcedo, Eleanor A. Powell, A. George Smulian, Margaret V. Powers-Fletcher*
- Difficult-To-Detect *Staphylococcus aureus*: mecA-Positive Isolates Associated with Oxacillin and Cefoxitin False-Susceptible Results** e02038-19  
*Amy S. Gargis, Brian B. Yoo, David R. Lonsway, Karen Anderson, Davina Campbell, Thomas O. Ewing, Adrian Lawsin, María-José Machado, Norihisa Yamamoto, Alison Laufer Halpin, Joseph D. Lutgring, Maria Karlsson, J. Kamile Rasheed, Christopher A. Elkins*
- Matrix-Assisted Laser Desorption Ionization–Time of Flight Mass Spectrometry (MALDI-TOF MS) for Investigation of *Mycobacterium tuberculosis* Complex Outbreaks: a Type Dream?** e02077-19  
*J. A. O'Connor, G. D. Corcoran, B. O'Reilly, J. O'Mahony, B. Lucey*
- Verification Is an Integral Part of Antimicrobial Susceptibility Test Quality Assurance** e01986-19  
*Romney M. Humphries, Patricia J. Simner*
- College of American Pathologists (CAP) Microbiology Committee Perspective: the Need for Verification Studies** e02105-19  
*Christina M. Wojewoda, Neil W. Anderson, Romney M. Humphries, Isabella W. Martin, Blaine A. Mathison, Allison R. McMullen, Frederick S. Nolte, David R. Peaper, Dylan R. Pillai, Carol A. Rauch, Dan D. Rhoads, Susan E. Sharp, Rosemary C. She, Patricia J. Simner, Kaede V. Sullivan, Elitza S. Theel, Angela M. Theiss, Richard B. Thomson, Jr., Bobbi S. Pritt*
- Reply to Humphries and Simner, "Verification Is an Integral Part of Antimicrobial Susceptibility Test Quality Assurance," and Wojewoda et al., "College of American Pathologists (CAP) Microbiology Committee Perspective: the Need for Verification Studies"** e02062-19  
*James E. Kirby, Thea Brennan-Krohn, Kenneth P. Smith*
- The Clinical Impact of a Negative Molecular  $\beta$ -Lactamase Gene Test for *Enterobacteriaceae*: Let's Not Let Perfect Be the Enemy of Really Good** e02098-19  
*Jason M. Pogue, Emily L. Heil*
- Reply to Pogue and Heil, "The Clinical Impact of a Negative Molecular  $\beta$ -Lactamase Gene Test for *Enterobacteriaceae*: Let's Not Let Perfect Be the Enemy of Really Good"** e02114-19  
*Romney M. Humphries, Kyle Spafford, Shawn MacVane*