

Christopher D. Doern, PhD, Associate Professor, Associate Director of Microbiology, Department of Pathology, VCU School of Medicine



Undergraduate Education

- BS, Wake Forest University

Graduate Education

- PhD, Wake Forest University Health Sciences

Post Graduate Education

- 2008 - 2010 - Medical and Public Health Microbiology Fellowship - Washington University School of Medicine, St. Louis, MO

Certifications

- American Board of Medical Microbiology, 2010

Bio

I have been very involved in the implementation and study of new technologies in the clinical microbiology laboratory. Specifically, I have been actively involved in the use of matrix assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) for the identification of microorganisms. I have published several reviews, given workshops and numerous lectures on the subject of implementing this technology for clinical use. I have also coordinated a 9-center research collaboration to better understand MALDI-TOF MS performance.

In addition to work with MALDI-TOF MS organism identification, I have research interests which include studying the emergence of Gram-negative antibiotic resistance, improving the diagnosis of pediatric bloodstream infection, and studying the impact and outcomes associated with implementing new technology in the clinical microbiology laboratory.

I have an interest in the development of alternative educational material and am the co-founder of the Medical Microbiology Question of the Day. Along with Dr. Carey-Ann Burnham, I have developed a service that provides medical microbiology-based questions three times a week. The service was originally intended to aid residents and fellows in board preparation but has grown to include thousands of microbiologists, pathologist and infectious disease physicians from all over the world.

Research Expertise

I have two primary areas of interest in research. The first is in better understanding the diagnosis of infectious diseases children. Specifically, I have focused my efforts on improving the diagnosis of blood stream infection as well as urinary tract infection. These are both areas in which much of what we "know" is inferred from the adult literature and there is much to be learned about how diagnosis differs in children.

Second, I am interested in developing methods to understand the true impact of new technology on patient care. Microbiology is experiencing unprecedented technological advances that have improved the way we diagnose infectious diseases. Historically, the clinical microbiology discipline has not effectively shown that these interventions have meaningful impacts on patient care. I am working to develop robust methods that will facilitate these outcome-based analyses.

Clinical Specialties

I have a particular interest in the diagnosis of pediatric infectious diseases and the utilization of MALDI-TOF MS for organism identification.

Teaching Expertise

I have expertise in case-based teaching methods in clinical microbiology as well as in traditional lecturing. In addition, I have great interest in developing alternative educational methods beyond formal lecture-style teaching. In particular, I have an interest in question-and-answer based learning and have co-founded a Medical Microbiology Question of the Day website dedicated to this style of teaching. This free service has been in operation for 6 years and has a membership that exceeds 6,000 learners of all levels, from undergraduate students to faculty. We have members in all 50 states and over 50 countries world-wide.

Keywords & Interest Areas

- Pediatric Blood Stream Infections
- Organism Identification by MALDI-TOF MS
- Molecular Diagnostics of Infection Diseases
- Emerging Mechanisms of Gram-negative Antimicrobial Resistance

- Laboratory Stewardship

Awards & Honors

- 2003-2004 Graduate Fellowship, Wake Forest University Graduate School
- 2004-2006 Ruth L. Kirschstein National Research Service Award, Department of Health and Human Services
- 2005 and 2007 Student Travel Award, Mid-Atlantic Microbial Pathogenesis Meeting
- 2013 and 2014 Outstanding Speaker Award, American Association of Clinical Chemistry
- 2014 Young Investigation Award, Mass Spectrometry: Applications to the Clinical Lab

Selected Peer Reviewed Publications

- Campigotto A, Richardson SE, Sebert M, McElvania TeKippe E, Chakravarty A, **Doern CD**. Low Utility of the Pediatric Isolator Blood Culture System for the Detection of Fungemia in Children: A Ten Year Review. *J Clin Microbiol*. 2016 Jun 15:
- Cantey JB, **Doern CD**. "A Defective and Imperfect" Method: H. Christian Gram and the History of the Gram Stain. *Pediatr Infect Dis J*. 2015 Aug; 34(8):848
- Carter K, **Doern C**, Jo CH, Copley LA. The Clinical Usefulness of Polymerase Chain Reaction as a Supplemental Diagnostic Tool in the Evaluation and the Treatment of Children With Septic Arthritis. *J Pediatr Orthop*. 2016 Mar; 36(2):167-72
- Roberts JL, Tavallai M, Nourbakhsh A, Fidanza A, Cruz-Luna T, Smith E, Siembida P, Plamondon P, Cycon KA, **Doern CD**, Booth L, Dent P. GRP78/Dna K Is a Target for Nexavar/Stivarga/Votrient in the Treatment of Human Malignancies, Viral Infections and Bacterial Diseases. *J Cell Physiol*. 2015 Oct; 230(10):2552-78
- Beal SG, Couturier MR, Gander RM, **Doern CD**. Diagnostic Algorithm for the Diagnosis of Pediatric Parasitic Gastroenteritis. *J Clin Lab Anal*. 2016 Mar; 30(2):155-60
- **Doern CD**, Nguyen ST, Afolabi F, Burnham CA. Probiotic-associated aspiration pneumonia due to *Lactobacillus rhamnosus*. *J Clin Microbiol*. 2014 Aug; 52(8):3124-6
- **Doern CD**, Mirrett S, Halstead D, Abid J, Okada P, Reller LB. Controlled clinical comparison of new pediatric medium with adsorbent polymeric beads (PF Plus) versus charcoal-containing PF medium in the BacT/alert blood culture system. *J Clin Microbiol*. 2014 Jun; 52(6):1898-900
- Chamberland RR, Burnham CA, Storch GA, Jackups R, **Doern CD**. Prevalence and Seasonal Distribution of Norovirus Detection in Stools Submitted From Pediatric Patients for Enteric Pathogen Testing. *J Pediatric Infect Dis Soc*. 2015 Sep; 4(3):264-6
- Park JY, Dunbar KB, Mitui M, Arnold CA, Lam-Himlin DM, Valasek MA, Thung I, Okwara C, Coss E, Cryer B, **Doern CD**. *Helicobacter pylori* Clarithromycin Resistance and Treatment Failure Are Common in the USA. *Dig Dis Sci*. 2016 Feb 29:
- **Doern CD**, Park JY, Gallegos M, Alspaugh D, Burnham CA. Investigation of Linezolid Resistance in Staphylococci and Enterococci. *J Clin Microbiol*. 2016 May; 54(5):1289-94

Books, Book Chapters, & Monographs

- **Doern CD** Revell P. *The Dark Art of the Blood Culture Textbook: Chapter: Pediatric Blood Cultures*. ASM Press. Pending publication.

- **Doern CD** and Forbes BA. Fundamentals of Bacteriology. *Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 6th edition*. Chapter 74. Pending publication
- **Doern CD**, Jerris RC, Gonzalez MD. 2016. Matrix Assisted Laser Desorption Ionization Time-of-Flight Mass Spectrometry for the Clinical Laboratory. *MALDI-TOF in Microbiology and Molecular Biology*. Pages 9-31. Horizon Scientific Press and Caister Academic Press.
- **Doern CD** and Burnham CD. 2016. Selective Reporting and Antimicrobial Stewardship. *Antimicrobial Stewardship: Principles and Practice*. CAB International. Pages 110-123. Edited by LaPlante KL, Cunha CB, Morrill JH, Rice LB, Mylonakis, E.
- **Doern CD**, Holfelder M. 2014. Automation and Laboratory Design. *Manual of Clinical Microbiology 11th Edition*. ASM Press. Pages 44-53. Edited by Jorgensen JH, Pfaller MA, Carroll KC, Funke G, Landry ML, Richter SS, Warnock DW.
- **Doern CD**, Holfelder M. Automation and Laboratory Design. *Manual of Clinical Microbiology 12th Edition*. ASM Press. Pages TBD. Edited by Jorgensen JH, Pfaller MA, Carroll KC, Funke G, Landry ML, Richter SS, Warnock DW.
- **Doern CD**. 2013. Charting Uncharted Territory: A Review of the Validation and Implementation Process for Matrix Assisted Laser Desorption Ionization Time of Flight Mass Spectrometry (MALDI-TOF MS) for Organism Identification. *Clinical Microbiology Newsletter*. May; 35(9): 69-78.
- Burnham CD, **Doern CD**, Binder SR. 2013. Immunoassay Handbook, 4th Edition – Chapter 9.19: Viral Diseases. *Elsevier Science*. Edited by Wild D.
- Burnham CD, **Doern CD**, Binder SR. 2013. Immunoassay Handbook, 4th Edition – Chapter 9.20: Bacterial Diseases. *Elsevier Science*. Edited by Wild D.
- Glen T. Hansen, **Doern CD**. 2012. Management of Point of Care Testing, 2nd Edition. Clinical Laboratory Management. *ASM Press*. Edited by Garcia LS.