

EUGENE C. COLE, DrPH

Dr. Gene Cole is Director of Research for LRC Indoor Testing & Research, Cary, NC; and formerly Professor of Environmental Health Sciences at Brigham Young University, Provo, UT. He has over 35 years of research experience, with emphasis on identification and reduction of pollutant reservoirs and sources, bioaerosols, residential, school, and workplace exposure assessment and control, product evaluation, cleaning and restoration, mold and sewage remediation, and biocides. He has also worked with national and international organizations to address environmental health and infectious disease concerns such as medical waste management in Central Europe and South East Asia, hygiene promotion in Africa, and healthy homes and buildings in the U.S. and Asia.

He has over 30 years of research experience in the area of biocides and antimicrobial agents, with emphasis on test methods development, and product application. At the University of North Carolina, he directed the USEPA funded research program on *Disinfectant Test Methods Evaluation and Development* that focused on evaluation of deficiencies in standard disinfectant tests, and development of new, less variable, and more reproducible methods.

Dr. Cole directed studies for the USEPA on *Indoor Air Quality Monitoring in Carpeted Environments*, and *Evaluation of Medical Waste Treatment Technologies*; served as technical director for a USAID Local Environmental Management waste project in Hungary; and was co-developer of the American Industrial Hygiene Association's EMPAT program for laboratory proficiency and accreditation in environmental microbiology. He has also served as a technical consultant to the World Health Organization (WHO), the Centers for Disease Control (CDC), the US Federal Trade Commission (FTC), and various industry associations.

He assisted the Institute of Inspection, Cleaning and Restoration Certification (IICRC) with finalization of the 2nd and 3rd editions of the S500 Standard and Reference Guide for Professional Water Damage Restoration (1999, 2006), with a focus on *Microbiology Associated with Water Damage*; and was a contributor to the IICRC S520 Mold Remediation Standard, 2nd edition (2008) with a focus on *Fungal Ecology and Health Effects*; and co-authored the chapter on *Biocides and Antimicrobial Agents* for the ACGIH text, *Bioaerosols: Assessment and Control*.

Dr. Cole is a member of Science Advisory Council of the Cleaning Industry Research Institute (CIRI) and is a Fellow of the American Industrial Hygiene Association (AIHA). He holds a Master of Science in Public Health Microbiology and a Doctor of Public Health in Biohazard Science and Occupational Health, both from UNC Chapel Hill.

Select Publications:

Cole, E.C. (2019). Cleaning and Special Environments – Understanding the Science. *Cleaning Science Quarterly*, Fall 2019, 20-28.

Cole, E.C. (2018). The Science of Sewage: Risks for Public and Worker Health in the New Millennium. *Cleaning Science Quarterly*, Fall 2018, 14-21.

Brennan, T, Cole, G., Stephens, B. (2018). Report to the U.S. Environmental Protection Agency on Guidance Documents to Safely Clean, Decontaminate, and Reoccupy Flood-Damaged Houses.

<https://www.epa.gov/indoor-air-quality-iaq/report-flood-related-cleaning>

Patha, S.A.K., Cole, E.C., Barnes, M.D. (2017). Reducing Risk of Respiratory Illness Associated with Traditional Cookstoves in a Rural Community in India: An Initial Assessment. *Journal of Environmental Health*, Oct: 80(3) E1-E7.

Havarinen-Shaughnessy, U., Shaughnessy, R.J., Cole, E.C., Toyinbo, O., Moschandreas, D.J. (2015). An Assessment of Indoor Environmental Quality in Schools and its Association with Health and Performance. *Building and Environment*, published online March 2015.

Shaughnessy, R.J., Cole, E.C., Moschandreas, D., Havarinen-Shaughnessy, U. (2013). ATP as a Marker for Surface Contamination of Biological Origin in Schools and as a Potential Approach to the Measurement of Cleaning Effectiveness. *Journal of Occupational and Environmental Hygiene* 10:336-346.

Cole, E.C., Hawkley, M., Rubino, J.R., Crookston, B., McCue, K., Dixon, J., Maqelana, T., Cwayi, J., Adams, C., Kim, J. (2012). Comprehensive Family Hygiene Promotion in Peri-Urban Cape Town: Gastrointestinal and Respiratory Illness and Skin Infection Reduction in Children Under Age Five. *South African Journal of Child Health* 6(4):109-117.

Holland, J., Banta, J., Passmore, B., Ayers, M., Abbott, S.P., Cole, E.C. (2012). Bacterial Amplification and In-place Carpet Drying: Implications for Category 1 Water Intrusion Restoration. *Journal of Environmental Health* May;74(9):8-14.

Johnson, E., E. Cole, and R. Merrill (2009). Environmental Health Risks Associated with Off-Campus Student-Tenant Housing. *Journal of Environmental Health*, January-February, pp. 43-47.

Cole, E.C. (2003). Gas-Phase Ozone: Assessment of Biocidal Properties for the Indoor Environment – A Critical Review. *Applied Biosafety* 8(3):112-117.

Cole, E.C., R. Addison, J. Rubino, K. Leese, P. Dulaney, M. Newell, J. Wilkins, D. Gaber, T. Wineinger, and D. Criger (2003). Investigation of Antibiotic and Antibacterial Agent Cross-Resistance in Target Bacteria from Homes of Antibacterial Product Users and Non-Users. *Journal of Applied Microbiology* 95:664-676.

Cole, E.C. and B. M. Lantrip. (2001). Suggested Practice for Remediation of Highly Infectious Biological Agent Contamination in Indoor Environments. *Applied Biosafety* 6(3): 136-138.

Cole, E.C. (2000). Infectious Waste Disposal in Developing Countries: Recommended Minimal Practices from a Hospital Survey in Southeast Asia. *Journal of the American Biological Safety Association* 5(2):42-46.

Leese, K.E., E.C. Cole, and P.A. Jensen. (1999). Assessment of Blood-Splash Exposures of Medical-Waste Treatment Workers. *Journal of Environmental Health* 61:8-11.

Cole, E.C., C.E. Cook, P.D. Dulaney, K.E. Leese, M.S. Newell, M.U. Ahmed, L. Selman, H.A. Bowers, A.L. Corbett, and C.J. Cole. (1999). Mold & Mildew in the Home Environment: Characterization and Control of Hard Surface Reservoirs. *Proceedings of the 8th International Conference on Indoor Air Quality and Climate*, Edinburgh, Scotland, vol. 2, pp. 513-17.

Cook, C.E., E.C. Cole, P.D. Dulaney, and K.E. Leese (1999). Reservoirs of Opportunistic Fungi in the Home Environment: A Guide for Exposure Reduction in the Immunocompromised. *Proceedings of the 8th International Conference on Indoor Air Quality & Climate*, Edinburgh, Scotland, vol. 1, pp. 905-909.

Cole, E., C. Cook, P. Dulaney, K. Leese, M. Newell, M. Ahmed, L. Selman, H. Bowers, A. Corbett, and C. Cole (1999). Characterization, Prevention, and Control of Mildew in Residential Environments: An Applied Research Study. In: E. Johanning, ed, *Bioaerosols, Fungi, and Mycotoxins: Health Effects, Assessment, Prevention and Control*, ENYO&EHC and Mt. Sinai School of Medicine, New York, 516-519.

Cole, E.C. and C.E. Cook. (1998). Characterization of Infectious Aerosols in Health Care Facilities: An Aid to Effective Engineering Controls and Preventive Strategies. *American Journal of Infection Control*, 26:453-464.

Reponen, T., S. Gizenko, S. Grinshpun, K. Willeke, E. Cole (1998). Characteristics of Airborne Actinomycete Spores. *Applied & Environmental Microbiology* 64:3807-3812.

Rutala, W.A., E.C. Cole, C.A. Thomann, and D.J. Weber. (1998). Stability and Bactericidal Activity of Chlorine Solutions. *Infection Control & Hospital Epidemiology* 19:323-327.

Franke, D.L., E.C. Cole, K.E. Leese, K.K. Foarde, and M.A. Berry. (1997). Cleaning for Improved Indoor Air Quality: an Initial Assessment of Effectiveness. *Indoor Air* 7:41-54.

Leese, K.E., E.C. Cole, R.M. Hall, and M.A. Berry. (1997). Measurement of Airborne and Floor Dusts in a Non-Problem Building. *American Industrial Hygiene Association Journal*, 58:432-438.

Cole, E., P. Dulaney, K. Leese, K. Foarde, D. Franke, and M. Berry. (1996). Biopollutant Sampling and Analysis of Indoor Surface Dusts: Characterization of Potential Sources and Sinks. In: B.A. Tichenor, ed., *Characterizing Sources of Indoor Air Pollution and*

Related Sink Effects, ASTM STP 1287, American Society for Testing and Materials, 153-165.

Leese, K.E., E.C. Cole, and R.M. Hall. (1995). Measurement of Airborne Particle Counts and Mass in a Healthy Building During a One-Year Cleaning Effectiveness Study. *Proceedings of the USEPA/Air & Waste Management Association International Symposium: Measurement of Toxic and Related Air Pollutants*.

Cole, E., K. Foarde, K. Leese, D. Green, D. Franke, and M. Berry. (1994). Assessment of Fungi in Carpeted Environments. In: *Health Implications of Fungi in Indoor Environments*, Air Quality Monographs, Vol. 2. Elsevier, Amsterdam, pp. 103-128.

Foarde, K., E. Cole, D. VanOsdell, D. Bush, D. Franke, and J. Chang. (1994). Characterization of Environmental Chambers for Evaluating Microbial Growth on Building Materials. In: *Health Implications of Fungi in Indoor Environments*, Air Quality Monographs, Vol. 2. Elsevier, Amsterdam, pp. 439-449.

Berry, M., J. Bishop, C. Blackburn, E. Cole, W. Ewald, T. Smith, N. Suazo, and S. Swan. (1994). Suggested Guidelines for Remediation of Damage from Sewage Backflow into Buildings. *Journal of Environmental Health* 57:9-15.

Cole, E.C. (1994). Aerosol Characterization. In: *Proceedings of the NIOSH Workshop on Engineering Controls for Preventing Airborne Infections in Workers in Health Care and Related Facilities*, pp. 51-72.

Lenhart, S.W. and E.C. Cole. (1993). Respiratory Illness in Workers of an Indoor Shiitake Mushroom Farm. *Applied Occupational and Environmental Hygiene* 8:112-119.