Environmental Microbiology, Second Edition: A Laboratory Manual (Maier and Pepper Set)

Ian L. Pepper, Charles P. Gerba, Jeffrey W. Brendecke
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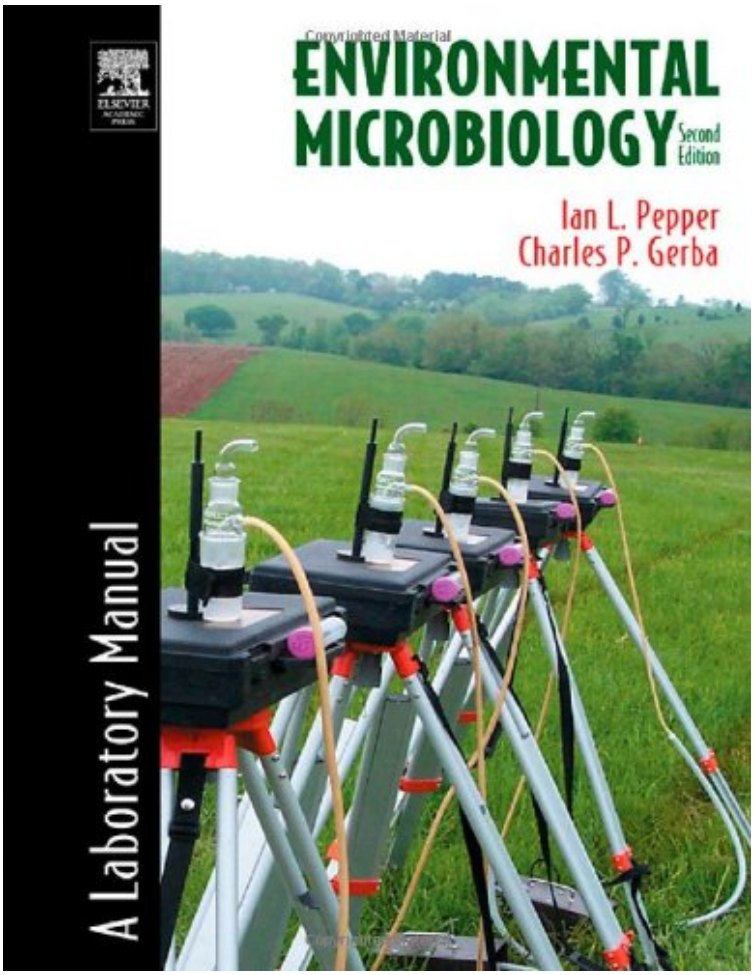

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Environmental Microbiology: A Laboratory Manual is designed to meet the diverse requirements of upper division and graduate-level laboratory sessions in environmental microbiology. The experiments introduce students to the activities of various organisms and the analyses used to study them. The book is organized into three thematic sections: Soil Microbiology, Water Microbiology, and Environmental Biotechnology. The first section includes experiments on the soil as a habitat for microorganisms, and introduces the main types of soil microorganisms, how they interact with the soil, and the techniques used in their analysis. Experiments in the second section cover assays of microbial pathogens--bacteria, viruses, and protozoan parasites--used in food and water quality control as well as an exercise in applied bioremediation of contaminants in water. The final section on biotechnology includes applications of the polymerase chain reaction (PCR) for the detection of bacteria and the use of enrichment cultures and a computer-based, physiological test bank to isolate and identify a bacterium useful in bioremediation. Designed for maximum versatility and ease of use for both the student and instructor, each experiment is self-contained and includes theoretical, practical, and pedagogical material. * New edition incorporates new experiments and the latest techniques * Designed for maximum versatility and ease of use for the student and instructor* Each experiment is self-contained and includes theoretical, practical, and pedagogical material.

"I would strongly recommend this laboratory manyal for any environmental microbiology course. It comes as a perfect complementary laboratory manual to the textbook "Environmental Microbiology" by R.M. Maier, I.L. Pepper and C.P. Gerber."- Dr. Hanan El-Mayas, Georgia State University"Environmental Microbiology: A Laboratory Manual provides a very good introduction to a variety of approaches used to assess microorganisms in the environment." - Deborah T. Newby, Idaho National Laboratory"The book has been written by two outstanding microbiologists and addresses critical methodological techniques for microbial analyses. The manual is designed for upper division and graduate-level laboratories in environmental microbiology. However, every laboratory dealing with microbes should have this excellent manual. In particular, I highly recommend it for laboratories that assess microbial risks and advantages. These include wastewater and water-treatment plants, soil-carbon-sequestration centers, and forensics and homeland-security laboratories. The bio-threat agents covered in the manual include bacteria (anthrax), viruses, and protozoan parasites (Cryptosporidium and Giardia). The new methods of polymerase chain reaction (PCR) and sequence analysis are given. Sample problems allow the self-study student to follow correct procedures. The glossary is a valuable appendix. I thank the authors for making this information available to the many scientists and technicians who will benefit from it." - M.B. Kirkham, Kansas State University and author of Principles of Soil and Plant Water Relations"[The manual] familiarizes the students with basic procedures and hands on experiments that are used as standard procedures by environmental agencies such as EPA for assessing waste treatment quality, water and food quality....The experimental procedures are presented in clear, concise and easy to follow steps....I finally would strongly recommend this laboratory manual for any environmental microbiology course (at the undergraduate/graduate level). It comes as a perfect complementary laboratory manual to the Text Book Environmental Microbiology by R.M. Maier, I.L. Pepper and C.P. Gerba (Academic Press, 2002)." -Hanan Lea El-Mayas, Georgia State University"...very useful for orienting current and future regulatorys to the problems and methods employed in the field."- David Yohalem, for INOCULUMFrom the Back CoverEnvironmental Microbiology: A Laboratory Manual is designed to meet the diverse requirements of upper division and graduate-level laboratory sessions in environmental microbiology. The experiments introduce students to the activities of various organisms and the analyses used to study them. The book is organized into three thematic sections: Soil Microbiology, Water Microbiology, and Environmental Biotechnology. The first section includes experiments on the soil as a habitat for microorganisms, and introduces the main types of soil microorganisms, how they interact with the soil, and the techniques used in their analysis. Experiments in the second section cover assays of microbial pathogens--bacteria, viruses, and protozoan parasites--used in food and water quality control as well as an exercise in applied bioremediation of contaminants in water. The final section on biotechnology includes applications of the polymerase chain reaction (PCR) for the detection of bacteria and the use of enrichment cultures and a computer-based, physiological test bank to isolate and identify a bacterium useful in bioremediation. Designed for maximum versatility and ease of use for both the student and instructor, each experiment is self-contained and includes theoretical, practical, and pedagogical material.About the AuthorDr. Ian Pepper is currently a Professor at the University of Arizona. He is also Director of the University of Arizona, Environmental Research Laboratory (ERL) and the NSF Water and Environmental Technology (WET) Center. Dr. Pepper is an environmental microbiologist specializing in the molecular ecology of the environment. His research has focused on the fate and transport of pathogens in air, water, soils and wastes. His expertise has been recognized by membership on six National Academy of Science Committees and former memberships on an EPA FIFRA Science and Advisory Panel. Dr. Pepper is a Fellow of the American Association for the Advancement of Science, American Academy of Microbiology, the Soil Science Society of America, and the American Society of Agronomy. He is also a Board Certified Environmental Scientist within the American Academy of Environmental Engineers and Scientists. He is the author or co-author of six textbooks; 40 book chapters; and over 180 peer-review journal articles.Dr. Charles P. Gerba is a Professor at the University of Arizona. He conducts research the transmission

of pathogens through the environment. His recent research encompasses the transmission of pathogens by water, food and fomites; fate of pathogens in land applied wastes; development of new disinfectants; domestic microbiology and microbial risk assessment. He has been an author on more than 500 articles including several books in environmental microbiology and pollution science. He is a fellow of the American Academy of Microbiology and the American Association for the Advancement of Science. In 1998 he received the A. P. Black Award from the American Water Works Association for outstanding contributions to water science and in 1996 he received the McKee medal from the Water Environment Federation for outstanding contributions to groundwater protection. He received the 1999 Award of Excellence in Environmental Health from National Association of County and City Health Officials.