

Laboratory Exercise 18: Environmental effects on microbial growth

Each microbial species can tolerate a range of environmental condition that affects microbial enzymes, membranes and other components. You will examine the growth of several bacteria in varying pH, salt, and temperature conditions.

Water is essential to all forms of life. It is not only the principal component of cytoplasm, but also an essential source of electrons and hydrogen ions. Organisms, like plants, require water to maintain cellular turgor pressure. Whereas water in prokaryotes requires it to prevent shrinking of the cell resulting in separation of the membrane from the cell wall, a condition called plasmolysis.

Bacteria constitute a diverse group of organisms that have developed many adaptations for survival. For example, some bacteria halophiles grow optimally in NaCl concentrations 3% or higher. Extreme halophiles are organisms with specialized cell membrane and enzymes that require salt concentrations from 15% up to about 25% and will not survive where salinity is lower. Except for a few osmotolerant bacteria, which will grow over a wide range of salinities, most bacteria live where NaCl concentrations are less than 3%.

Bacterial Cultures:*Escherichia coli**Staphylococcus aureus**Bacillus cereus***pH Test Materials:**

3 pH 3 tubes

3 pH 7 tubes

3 pH 9 tubes

Procedure:**pH Effects on Microbial Growth**

1. Obtain 3 tubes of pH 3, 7, 9. Label them with the organism's name, and group name. Example: pH 3, 7, 9 tubes will be labeled with *E. coli*.
2. Inoculate the pH broths with the test organisms.
3. Incubate tubes at 37°C for 48 hours.

Second Lab Day:

1. Record the growth you observe as - (no growth), +, ++, +++, and ++++ (lots of growth).

Bacterial Cultures:*Escherichia coli**Staphylococcus aureus**Bacillus cereus*

Microbiology Lab Manual Questions And Answers

Peipei Pang



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Laboratory Manual of Microbiology Vivek Kumar, 2012-03-01 This laboratory manual of microbiology has been written to meet the needs of students taking microbiology as major or subsidiary subject The intention is to provide the students with well organized user friendly tool to better enable them to understand laboratory aspects of microbiology as well as to hopefully make learning laboratory material and preparing for independent player of a given experiment Each exercise provides step by step procedure to complete the assignment successfully and easily The lab exercises are designed to give the student hands on laboratory experience to better reinforce certain topics discussed in exercise The glossary is included covering terms as well as basic discipline specific terminology from microbiology that will be helpful to its readers The main contents of the manual are Microbiology laboratory practices and safety rules Basic laboratory techniques Microscopy Staining and motility techniques Environmental microbiology Microbiological culture techniques Growth of lactose fermenting and non fermenting microbes Medical microbiology Environmental effect on bacterial growth Application of microbiology Microbiology of milk and Appendices The academic level of the book is graduate post graduate students research workers teachers and scientists dealing with basic and applied aspects of microbiology

Laboratory Exercises in Microbiology Robert A. Pollack, Lorraine Findlay, Walter Mondschein, R. Ronald Modesto, 2018-07-11 The Laboratory Exercises in Microbiology 5e by Pollack et al presents exercises and experiments covered in a 1 or 2 semester undergraduate microbiology laboratory course for allied health students The labs are introduced in a clear and concise manner while maintaining a student friendly tone The manual contains a variety of interactive activities and experiments that teach students the basic concepts of microbiology The 5th edition contains new and updated labs that cover a wide array of topics including identification of microbes microbial biochemistry medical microbiology food microbiology and environmental microbiology

Molecular Microbiology Laboratory Walt Ream, Bruce Geller, Katherine Field, 2012-08-31 Intends to teach principles and techniques of molecular biology and microbial ecology to upper level undergraduates majoring in the life sciences and to develop students scientific writing skills This title exposes students to the molecular based techniques It provides faculty with an accessible resource for teaching protocols

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Microbiology: Laboratory Theory and Application Michael J. Leboffe, Burton E. Pierce, 2015-01-01 Designed for major and non major students taking an introductory level microbiology lab course Whether your course caters to pre health professional students microbiology majors or pre med students everything they need for a thorough introduction to the subject of microbiology is right here

Microbiology Practical Manual, 1st Edition-E-book Amita Jain, Jyotsna Agarwal, Vimala Venkatesh, 2018-09-15 This book is a practical manual in Microbiology for 2nd year MBBS students There is no standard book for practical exams in the market This book will be a student s companion in their Microbiology practical class where they can read it do their experiments as per directions given in book and do their assignments It would be a complete practical book with tutorials at

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Explains techniques in an accessible manner using flow charts and drawings Employs a building block approach throughout with each new chapter building upon skills from the previous chapter Selected Exercises for Microbes in Action, Fourth Edition Harry W. Seeley, Paul J. Vandemark, John J. Lee, 1990-10-15 Laboratory Manual of Microbiology for Nurses Elizabeth S. Gill, James Thomas Culbertson, 1952 Current Catalog National Library of Medicine (U.S.), First multi year cumulation covers six years 1965-70 Laboratory Exercises in Microbiology John P. Harley, 2004-02 Provides an introduction to laboratory techniques and principles that are important in each area of microbiology This work is prepared to accompany Prescott et al's Microbiology 6e Food Microbiology Phyllis Entis, 2002 **Student Lab Manual for Argument-Driven Inquiry in Physical Science** Jonathon Grooms, Patrick J. Enderle, Todd Hutner, Victor Sampson, 2016-10-01 Are you interested in using argument driven inquiry for middle school lab instruction but just aren't sure how to do it Argument Driven Inquiry in Physical Science will provide you with both the information and instructional materials you need to start using this method right away The book is a one stop source of expertise advice and investigations to help physical science students work the way scientists do Student Lab Manual for Argument Driven Inquiry in Life Science provides the student materials you need to guide your students through these investigations With lab details student handouts and safety information your students will be ready to start investigating Laboratory Experiments in Microbiology Christine L. Case, Ted R. Johnson, 1984 **Microbiology** Jacquelyn G. Black, 1996 This text follows a body systems approach to microbiology paying attention to real life connections and covering such topics as the characteristics of microbial metabolism growth and genetics **Linne & Ringsrud's Clinical Laboratory Science E-Book** Mary Louise Turgeon, 2018-12-22 Thoroughly updated and easy to follow Linne Ringsrud's Clinical Laboratory Science Concepts Procedures and Clinical Applications 8th Edition offers a fundamental overview of the laboratory skills and techniques you'll need for success in the clinical laboratory Author Mary Louise Turgeon's simple and straightforward writing clarifies complex concepts and her unique discipline by discipline approach helps you build knowledge and learn to confidently perform routine clinical laboratory tests with accurate effective results Topics like safety measurement techniques and quality assessment are woven throughout the various skills The new eighth edition also features updated content including expanded information on viruses and automation It's the must have foundation for anyone wanting to pursue a profession in the clinical lab Broad content scope provides an ideal introduction to clinical laboratory science at a variety of levels including CLS MT CLT MLT and Medical Assisting Case studies include critical thinking and multiple choice questions to challenge readers to apply the content to real life scenarios Expert insight from respected educator Mary Lou Turgeon reflects the full spectrum of clinical lab science Detailed procedures guides readers through the exact steps performed in the lab Vivid full color illustrations familiarize readers with what they'll see under the microscope Review questions at the end of each chapter help readers assess your understanding and identify areas requiring additional study Evolve companion website

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Immunology & Serology in Laboratory Medicine - E-Book Mary Louise Turgeon, 2013-02-15 The 5th edition of this classic text sets the standard for comprehensive coverage of immunology Building from a solid foundation of knowledge and skills trusted author Mary Louise Turgeon takes you from basic immunologic mechanisms and serologic concepts to the theory behind the procedures you'll perform in the lab Immunology Serology in Laboratory Medicine Fifth Edition is the go to resource for everything from mastering automated techniques to understanding immunoassay instrumentation and disorders of infectious and immunologic origin Packed with learning objectives review questions step by step procedures and case studies this text is your key to succeeding in today's modern laboratory environment Full color six page insert of photomicrographs provide a better picture of what you'll see in the laboratory Learning objectives at the beginning of each chapter offer a measurable outcome you can achieve by completing the material Chapter highlights at the end of each chapter provide a summary of the most important information covered in each chapter Review questions at the end of each chapter are tied to learning objectives further enhance your understanding Case studies challenge you to apply your knowledge and help strengthen your critical thinking skills Glossary at the end of the book provides quick access to key terms and definitions NEW Expanded chapter on Vaccines as the importance of vaccines continues to become more evident NEW Updated chapter on Molecular Techniques incorporates the newest technology specific to immunology NEW Key terms at the beginning of each chapter help you learn the important vocabulary in immunology NEW Case studies with added multiple choice questions in addition to critical thinking questions will help you apply your knowledge and develop critical thinking skills

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