

Chapter 1 : FREE Microbiology Lecture Notes, Study Guide and Exam Help

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Microbial cytology-study of microscopic organisms and their submicroscopic details
Microbial physiology-study of microbial cells functioning
Microbial ecology-study of relationship between microorganisms and their environment
Cellular microbiology-bridging cell biology and microbiology
Microbial genetics-study of genes organization and functioning
Phylogeny-study of genetic relationship among organisms
Applied Microbiology
Industrial microbiology-the use of microbes in industrial processes such as waste treatment and industrial fermentation.
Medical microbiology-study of pathogenic microbes. Helps understand the role of microbes in human illness. It includes epidemiology, pathology, immunology and pathogenesis.
Pharmaceutical microbiology-study of microorganisms related to antibiotics production, enzymes, vaccines, vitamins among other pharmaceutical products.
Microbial microbiology-microorganism exploitation at molecular and genetic levels in the generation of useful products.
Agricultural microbiology-study of agricultural microorganisms. These are classified as Plant pathology and microbiology which is the study of interaction of plant to plant pathogens or microorganisms
Soil microbiology-the study of soil microorganisms
Food microbiology-study of microorganisms behind food spoilage and foodborne illnesses. Also studies the use of microorganisms to make foods and in food processes such as fermentation.
Environmental microbiology-study of the diversity and functions of microbes in the natural environment. Involves bacteria habitat characterization such as ground water ecosystems, rhizosphere, extremophiles, phyllosphere and open seas and oceans.
Veterinary microbiology-study of microorganisms in animal taxonomy or veterinary medicine.
Aero microbiology-study of airborne microorganisms.
Aquatic microbiology-study of microorganisms in water.
Biotechnology-study of recombinant DNA technology and genetic engineering.

Types Of Media In Microbiology

The media in relation to microbiology is the surface used to grow microorganisms. This can be solid, liquid or semi-solid media that supports cell growth. These media may be classified into two categories with the first being used for cell culture and the second for microbiological culture. The former is used for cells derived from animals or plants and the latter for microorganisms such as fungi or bacteria.

Common laboratory media

Basal media These are the media used without any modification. They include nutrient agar, nutrient broth and peptone water. Enterobacteriaceae and staphylococcus are grown on these media.
Enriched media These media are enriched with serum, egg or blood. Such media include Lowenstein-Jensen and blood agar and are used to grow streptococci.
Selective media These are the media selected for specific microorganisms. Such media inhibit the growth of the undesired microorganisms. These include macconkey agar, tellurite media and Lowenstein-Jensen. The inhibiting ability may come from an antibiotic that may be added to the medium.
Indicator media These media include indicators and the particular organisms will show change in the indicator. Some of the indicators used include neutral red, blood and tellurite. Such media are macconley agar and blood agar.
Transport media Just like the name suggests, these media are used to store microorganisms that cannot be cultured immediately after collection. They include amies media, cary-blair and stuart media. These include chalk cooked broth and egg saline media

Why Is Microbiology Important?

Microbiology is a very important discipline in this changing world. Microorganisms have been with us for centuries and have been affecting our day to day lives as well as our environments. Some of the key benefits include;

Agriculture Microbes are indispensable in the field of agriculture as they have a huge impact in the creation of soil that will support all sorts of crops and livestock. The study of microbiology helps farmers make informed decisions on nitrate levels and improve agricultural performance. Keeping our planet healthy
The protection of this planet is our responsibility and microbes come in handy as they ensure that minerals such as nitrogen and carbon are recycled instantly. This contributes to the maintenance of a well oxygenated atmosphere and active degradation of organic matter transforming organic carbon to carbon dioxide.
Chemical products Microorganisms are used in the production of solvents, antibiotics and pharmaceuticals. These products are vital in the growth of industries and

sustenance of healthy farms. This is not to mention that some are used to keep us healthy. Combating disease
Infectious diseases can wipe out entire plant or animal populations. Microbiology keeps outbreaks under control. With the study on microorganisms, scientists are able to develop vaccines and antibiotics that end up saving millions of lives. Biotechnology Microbiology lies at the heart of genetic engineering with scientists finding it incredibly exciting to move genes from an organism to the other. Scientists such as Antonie Van Leuwenhoek father of microbiology have made a huge impact in the field of science and technology with their works such as dyeing being used in cytology, hematology, parasitology, histology and microbiology. Food production Microbiology is the backbone of food production. Right from the growth to the processing of foods, microbiology comes to play in every stage. Microorganisms such as bacteria are used in the production of enzymes used in food processing such as yogurt fermentation and production of cleaning agents. Conclusion Microbiology is a study that has so much importance in our lives and only gets better with time. It has an impact on every aspect of life and we just cannot do without the microorganisms. Keep learning more about them and make the best use for better lives. Resources Please follow and like us:

Chapter 2 : What Is Microbiology All About: Microbiology Study Guide

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Microbiology is a relatively new science, spanning the past years. During this time, however, the study of microorganisms has revolutionized the way that we look at the world and our place in it. Indeed, many modern scientific disciplines can trace their origins back to microbiology. The beginnings of microbiology can be traced to the initial construction of instruments capable of directly visualizing microbes. The realization that some microbes can cause disease in humans, their crops, and their livestock was a defining moment in the history of microbiology. For many years various people had speculated that invisible organisms caused some diseases. However, there was no formal proof for these arguments. Even before microbes were fully appreciated, some investigators stumbled upon links between disease and these invisible life forms. The discipline of Immunology, the study of the immune system, has its roots in the study of microbes. Soon after the finding of microbial diseases, people set out to find ways to eliminate these threats to human health. All of our food products are directly obtained from other organisms. In the course of collection, processing, packaging, and distribution, microorganisms invariably contaminate foodstuffs. From our point of view, this contamination can have one of three possible outcomes. Often, the presence of microbes is detrimental, resulting in the decomposition of the produce. Other times, however, microbial colonization is beneficial and is actively promoted. Finally, some forms of microbial growth have little or no impact on the quality of our food products. These microbes vary enormously in their metabolic capacities. Because of their ubiquitous distribution and diverse metabolic abilities, the microbes play an essential role in the environmental homeostasis. The metabolic power of microorganisms has also been a historic source of industrial production. With the advent of recombinant molecular biology, though, the role of microbes has been changing in industry. This overview of the topic is designed to prepare you to pass the Excelsior College examination titled "Microbiology. As you read the text, pay particular attention to the terms in bold print, as test-out exams tend to be vocabulary-intensive. Multiple-choice practice questions are at the end of each unit. In addition, a final comprehensive practice exam appears at the end of the book. This practice examination is formatted like the actual test. Taking the practice exam will reinforce key concepts from the study guide, identify areas for further review, provide a gauge for managing testing time appropriately, and verify that the material has been mastered.

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