136C21 Practical II Microbial Physiology Summary

Course Units

Unit 1: Principles Of Motility Test

• Motility demonstration: Hanging drop
• wet mount preparation
• semi-solid agar
• Craigie’s tube method. Staining techniques: Smear preparation
• permanent specimen preparation
• capsular
• and acid-fast staining

Unit 2: Basic Concepts Of Staining Methods

• Direct counts – Direct cell count (Petroff-Hausser counting chamber)
• turbidometry. Viable count - pour plate
• spread plate. Bacterial growth curve.

Unit 3: Learn The Bacterial Count Using Different Methods

• Anaerobic culture methods. Antibiotic sensitivity testing: Disc diffusion test - Quality control with standard strains.

Unit 4: Study The Morphological Demonstration Of Microorganisms And Identification

• Morphological variations in algae
• fungi and protozoa. Micrometry: Demonstration of the size of yeast
• fungal filaments and protozoa.

Unit 5: Study The Biochemical Identification Of The Bacteria

• Methods of Bacterial Identification - Morphological
• physiological
• and biochemical methods - IMViC test
• H S
• TSI
• 2 oxidase
• catalase
• urease test
• and carbohydrate fermentation test. Maintenance of pure culture
• paraffin method
• stab culture
• maintenance of mold culture.

Course Outcomes

CO1: Describe hanging drop, wet mount preparation, semi-solid agar, Craigie's tube method.

CO2: Demonstrate Smear preparation, permanent specimen preparation, Capsular, and Acid-fast staining.

CO3: Explain antibiotic sensitivity testing: Disc diffusion test- quality control with standard strains.

CO4: Describe demonstration of the size of yeast, fungal filaments and protozoa.

CO5: Elaborate on the bacterial identification- morphological, physiological, and biochemical methods.

Text Books

1. James G Cappucino and N. Sherman MB (1996). A lab manual Benjamin Cummins, New York .
2. Kannan. N (1996).Laboratory manual in General Microbiology. Palani Publications.
3. Sundararaj T (2005). Microbiology Lab Manual (1st edition) publications.
4. Gunasekaran. P (2007). Laboratory manual in Microbiology. New age international publisher.
5. Elsa Cooper (2018). Microbial Physiology: A Practical Approach. Callisto Reference publisher.

Reference Books

1. DavidWhite., James Drummond., Clay Fuqua (2012) Physiology and Biochemistry of Prokaryotes. 4th Ed. Oxford University Press, New York.
2. Robert K. Poole (2004). Advances in Microbial Physiology, Elsevier Academic Press, New York, Volume 49.
3. Kim B.H., Gadd G.M. (2008). Bacterial Physiology and Metabolism. Cambridge University Press, Cambridge.
4. Dawes, I.W and Sutherland L.W (1992). Microbial Physiology (2nd edition), Oxford Blackwell Scientific Publications.
5. Moat, A.G and J.W Foaster, (1995). Microbial Physiology, 3rd edition. Wiley – LISS, A John Wiley & Sons. Inc. Publications.

Web Resources

1. https://sites.google.com/site/microbial physiologyoddsem/teaching-contents
2. https://courses.lumenlearning.com/boundless-microbiology/chapter/microbial-Nutrition
3. https://onlinecourses.swayam2.ac.in/cec20_bt14/preview
4. https://www.studocu.com/microbial-physiology-practicals
5. https://www.agr.hokudai.ac.jp/microbial-physiology