

Title of the Course: MICROBIAL GENETICS [P]

Course Code: MIC-503

Number of Credits: 1, Practical

Contact hours: 30

Effective from Academic Year: 2022-23

Prerequisites	Students should have basic knowledge of DNA and RNA structure and Prokaryotic and eukaryotic genome.	
Objective:	To learn the basic principles and techniques of microbial genetics.	
Content:		(30)
1.	Isolation of genomic DNA from bacteria.	
2.	Isolation of plasmid DNA from bacterial cells by Alkaline Lysis method.	
3.	Spectrophotometric quantification and determination of purity of bacterial plasmid and genomic DNA.	
4.	Agarose gel electrophoresis, visualization and documentation of plasmid and genomic DNA using Gel Doc system.	
5.	UV mutagenesis and screening of pigment deficient mutants of <i>Serratia marcescens</i> .	
Pedagogy:	Hands-on experiments in the laboratory, video, online data	
References/ Readings	Alberts, B., Johnson, A., Lewis, J., Morgan, D., Raff, M., Roberts, K. and Walter, P., Molecular Biology of the Cell, Garland Science. (2014)	
	Birnboim, H.C. and Doly, J., (1979) A rapid alkaline extraction procedure for screening recombinant plasmid DNA. Nucleic Acid Research, 7: 1513-1523.	
	Dale, J.W. and Park, S.F., Molecular Genetics of Bacteria, John Wiley (2010).	
	Freifelder, D. Molecular biology, a comprehensive introduction to prokaryotes and eukaryotes. JANE'S PUBLISHING INC., BOSTON, MA(USA). (1983).	
	Gardner, E.J., Simmons, M.J. and Snustad, D.P., Principles of Genetics, John Wiley & Sons. (2006).	
	Green, M. R. and Sambrook, J., Molecular Cloning: A laboratory manual, Cold Spring Harbour Laboratory Press, New York. (2014).	
	Holmes, D.S. and Quigley, M., A rapid boiling method for the preparation of bacterial plasmids. Anal Biochem., 114(1): 193-197. (1981)	
	Krebs J.E., Lewin B., Goldstein E.S. and Kilpatrick, S.T., LEWIS Genes XI, Jones and Bartlett Publishers. (2014).	
	Maloy, S. R., Cronan, J. E. and Freifelder, D., Microbial Genetics, Jones and Bartlett Publishers.	
	Peter, J. R., iGenetics: A Molecular Approach, Pearson Education. (2016).	
	Sambrook, J., Fritsch, E. F. and Maniatis, T., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory, New York. (1989).	

	Streips, U.N. and Yasbin, R.E., Modern Microbial Genetics, John Wiley. (2004).	
	Snyder, L., Peters, J. E., Henkin, T. M. and Champness, W., Molecular Genetics of Bacteria, ASM Press. (2013)	
	Trun, N. and Trempy, J., Fundamental Bacterial Genetics, John Wiley & Sons. (2003)	
	Watson, J. D., Baker, T. A., Bell, S. P., Gann, A., Levine, M., Losick, R. Molecular Biology of the Gene, Pearson/Benjamin Cummings. (2007).	
Course Outcomes	• Isolate genomic and plasmid DNA • Estimate genomic and plasmid DNA • Separate genomic and plasmid DNA • Perform mutagenesis for the development of strains.	