

SCHOOL OF LIFE SCIENCES
JAWAHARLAL NEHRU UNIVERSITY

LS456: Life Science Practical-II

(Dr. N. Puri*, Prof. P.C. Rath, Prof. K. Natarajan, Dr. N. Mondal, Dr. A. Bansal, Prof. S. Chakraborty, Prof. A.K. Nandi, Dr. S.K. Jha, Dr. A Mondal, Prof. A.S. Kharat)

Updated : April 2021

Course Name	Course In-charge/Faculty	Experiments
Molecular Biology	Prof. P.C. Rath	<ol style="list-style-type: none"> 1- Preparation of LB medium, LB+ agar(1.5%)+ ampicillin (100µg/ml) and LB+ agar (1.5%)+ nalidixic acid (15µg/ml) plates and other reagents. 2- Streaking of <i>E. coli</i> DH5α strain on LB+agar+ nalidixic acid plate. 3- Preparation of competent <i>E. coli</i> DH5α cells. 4- Transformation of <i>E. coli</i> DH5α cells with pBluescript plasmid DNA and recombinant DNA clones. 5- Isolation of plasmid DNA from overnight culture of the transformed colony/ clone. 6- Agarose gel electrophoresis of the plasmid DNA. 7- Restriction enzyme digestion of the plasmid DNA and clone verification. 8- Restriction enzyme digestion of the bacteriophage λ DNA/ genome by Hind III and Hind III+EcoR I and preparation of the restriction map for the double digest. 9- Preparation of a ball and stick model of B-DNA. Draw the chemical structures of A,T and G,C base pairs, show different groups/ bonds in the DNA and study the structural features. 10- Blue/ white screening of the recombinant DNA clone in <i>E.coli</i>.
Molecular Biology	Prof. K. Natrajan <i>This module of experiments would involve learning of genomic DNA isolation, serial dilutions, PCR and primer designing.</i>	<p>Day 1: Lecture on PCR; preparation of reagents and media; inoculate for genomic DNA isolation</p> <p>Day 2: Genomic DNA isolation and quantitation on gel</p> <p>Day 3: Primer designing; Set up PCR using serial dilutions of genomic/plasmid DNA template</p> <p>Run gel, analyze of gel results and discussion.</p>
Animal Tissue Culture	Dr. Neelima Mondal	<ol style="list-style-type: none"> 1- To study the cell cycle/ different phase of cell cycle. 2- Analysis by ModFit programme.
Immunology	Dr. Niti Puri	<ol style="list-style-type: none"> 1- Cell Counting of immune cells. 2- Immunophenotyping experiment/labeling/ running sample on Flowcytometry followed by analysis. 3- Detection of cytokines/chemokines in activated immune cell through ELISA.
Infectious Organism	Dr. A. Bansal	<ol style="list-style-type: none"> 1- Staining and counting parasitemia of the malaria parasite, <i>Plasmodium falciparum</i>. 2- Detection of <i>Leishmania</i> parasite infection by fluorescence microscopy. 3- Immunofluorescence assay (IFA) for testing protein localization in malaria parasite.

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Plant Physiology	Prof. S. Chakraborty	1. Estimation of photosynthetic efficiency 2. Separation of chlorophyll pigments using thin layer chromatography 3. Virus induced plant gene silencing and phenotyping
	Prof. A. Nandi	1. Plant Embryo development 2. Leaf epidermal patterning
Electro Physiology	Dr. S. K. Jha	1- Demonstration and application of rodent's stereotaxic instruments. 2- Demonstration of recorded brain waves. Identification of vigilant states in the recorded brain waves. 3- Identification of alpha, beta, delta, theta and gamma brain waves in recorded the EEG.
	Dr. A. Mondal	4- Measurement of arterial blood pressure. 5- Determination of blood group. <ul style="list-style-type: none"> • Study of haemin crystal. • Preparation & staining of human blood film. 6- TC & DC of RBC & WBC.
Microbe System	Prof. Arun S. Kharat	1- Determination of Minimum Inhibitory Concentration. 2- Biofilm Demonstration and Quantification. 3- Bacterial Adherence and Invasion to Human Cell Line. 4- Demonstration of Antimicrobial activity from Medicinal Plant(s).

Total: 32 days/64 hours

Due to Covid-19 pandemic related restrictions practical course will be delivered by online/virtual mode to include imparting theory behind practicals, actual practical in form of demonstrations/recorded videos/ other online resources, online discussion on data collection and analysis, and students will be maintaining records of practical experiments in data notebook.

Coordinator

Dr. Niti Puri

Dean, SLS