

References:

1. Nutritional Biochemistry, Tom Brody (1994) Academic Press.
2. Frontiers in Nutrition, Ed. T. Wilson and N.J. Temple, (2000), Humana
3. Nutrition & Health in Developing Countries, eds. R. Semba and M.W. Bloem, (2000), Humana.
4. Food and Nutrition, Swminathan

BCS 454: GENERAL VIROLOGY: SOFT CORE

Lecture Hours: 42

Total Credits: 03

Course Objectives

- To study the properties, nomenclature and classification of viruses
- To isolate, cultivate and purify different types of viruses
- To detect viruses by various assay methods
- To study the major characteristics of different families of viruses

UNIT-I

14 Hours

History: Discovery of viruses and development of Virology. Nature, origin and evolution of viruses. Properties of viruses : Physical- morphology and structure, sedimentation, electrophoretic mobility, buoyant density. Biochemical- chemical composition, nucleic acids, proteins, enzymes, lipids, carbohydrates, polyamines, cations. Antigenic nature of viruses. Biological host range, transmission (vector and non-vector), virus stability. Nomenclature and classification of viruses: Criteria used for naming and classification. Current ICTV classification of viruses of bacteria, plants and animals and humans.

UNIT-II

14 Hours

Isolation, cultivation, assay and maintenance of bacterial, plant and animal viruses : Experimental plants and tissue cultures. Experimental animals, embryonated eggs, organ cultures, primary and secondary cell cultures, suspension and monolayer cell cultures, cell strains, cell lines. Purification of viruses : Need for virus purification. Extraction of viruses from tissues, clarification, concentration of viruses in clarified extracts by physical and chemical methods, further purification of viruses by rate zonal / equilibrium density gradient centrifugation. Criteria of virus purity. Quantitation and preservation of purified virus preparations.

UNIT-III

14 Hours

Quantitation of viruses: Infectivity assay methods (plaque, pock, end point, local / systemic assay of plant viruses), physical (EM), serological (HA, HI, immunofluorescence, ELISA) and chemical (viral protein and nucleic acid based) approaches. Major characteristics of the following virus families / genera / groups : Adenoviridae, Bromoviridae, Bunyaviridae, Caulimoviridae, Flaviviridae, Geminiviridae, Hepadnaviridae, Herpesviridae, Orthomyxoviridae, Paramyxoviridae, Parvoviridae, Picornaviridae, Potyviridae, Poxviridae,