

# UNDERGRADUATE PROGRAMME IN BIOCHEMISTRY

## Paper No- 17

### Molecular Basis of Infectious Diseases

#### THEORY

This paper would deal with the fundamentals of medical microbiology, the biochemical and molecular basis of human infectious diseases and their diagnosis, prevention and treatment. The diseases would include, but not limited to, bacterial infections such as Tuberculosis and Typhoid, viral infections such as Hepatitis and AIDS, vector borne diseases such as Malaria, Dengue and Leishmaniasis, protozoan diseases such as Amoebiasis and Giardiasis, recent epidemics and pandemics such as SARS, Swine Flu and Chikungunea.

This paper could also deal with success stories such as eradication of small pox and polio to excite and motivate students.

The biology of the disease causing organism, pathology of the diseases, diagnosis, prevention and treatment of these diseases will be discussed with some case studies including application of Systems biology approaches.

#### PRACTICAL

The practicals will involve carrying out molecular assays for the detection of some of the above-mentioned diseases, analysis of data and their interpretation.

#### Suggested Readings:

1. Cases in Medical Microbiology and Infectious Diseases (2002) 3<sup>rd</sup> ed., Gilligan, P.H., Smiley, M.L. and Shapiro, D.S., ASM Press (Washington), ISBN: 978-1-55581-207-2.
2. Frontiers in Antimicrobial Resistance: a Tribute to Stuart B. Levy (2005) White, D.G., Alekshun, M.N. and McDermott, P.F., ASM Press (Washington), ISBN: 978-1-55581-329-1.
3. Structural Biology of Bacterial Pathogenesis (2005) Birbeck, G.W., Caparon, M. and Hulgren, S., ASM Press (Washington), ISBN: 978-1-55581-301-7.
4. Prescott, Harley, Klein's Microbiology (2008) 7th Ed., Willey, J.M., Sherwood, L.M., Woolverton, C.J. Mc Graw Hill International Edition (New York) ISBN: 978-007-126727.
5. Jawetz, Melnick and Adelberg's Medical Microbiology (2010) 25<sup>th</sup> ed., Brooks, G.F., Carroll, K.C., Butel, J.S., Morse, S.A. and Mietzner, T.A., McGraw Hill Publication.
6. Bacterial Pathogenesis: a Molecular Approach (2011) 3rd ed., Wilson, B.A., Salyers, A.A., Whitt, D.D. and Winkler, M.E., ASM Press (Washington), ISBN: 978-1-55581-418-2.
7. Immune Response to Infection (2011) Kaufmann, S.H.E., Rouse, B.T. and Sacks, D.L., ASM Press (Washington), ISBN: 978-1-55581-514-1.
8. Molecular Microbiology: Diagnostic Principles and Practice (2011) 2<sup>nd</sup> ed., Persing, D.H., ASM Press (Washington), ISBN: 978-1-55581-497-7.
9. Kuby Immunology (2012) 7th ed., Owen, J., Punt, J. and Stranford, S., W.H Freeman and Company (New York), ISBN-10: 1-4292-1919-X / ISBN-13: 978-1-4292-1919-8.