

**Optional Course**

**LS 579--Molecular Parasitology and Infectious Diseases [2 credits]**

Arun Kharat\*, Abhisheka Bansal

S No	Topic	Contact Hours
1.	Introduction to pathogens and Infectious diseases: nature of pathogens and modes of infection	2/ ASK
2.	Cellular structure and genome organization of bacterial and parasitic pathogens	2/ASK
3.	Host-Pathogen Interaction: pathogenesis, treatment / targets & resistance	
	<p><b>Bacterial Infections:</b></p> <p>A. <b>Pulmonary:</b> Pneumonia–atypical, chemically triggered/allergic/bacterial; <i>Streptococcus pneumoniae</i> – adherence and Invasion; pathogenesis, epidemicity; vaccine; treatment. Tuberculosis –socio-economic considerations, pathogenesis –virulence and immune factors; treatment; drug resistance; preventive measures.</p> <p>B. <b>Enteric:</b> Enteric pathogens, Enteritis –causative agents; opportunistic infections, virulence and immune system; toxins; treatment. Definition; types of infection; epidemiology; prophylactic measures; treatment options.</p> <p>C. <b>Antibiotics:</b> definition; classification; targets &amp; action. Antibiotic resistance: social, environmental and global concern; causes; mechanisms –enzymes, traits, vertical OR horizontal inheritance; challenges &amp; opportunity.</p> <p>D. <b>Bacterial toxins &amp; toxinosis:</b> septic shock. Advanced diagnostics of bacterial infections.</p>	12/ASK
	<p><b>Parasitic infections:</b></p> <p>A. Introduction of parasitic infectious diseases and classification. Sarcocystidophora (<i>Entamoeba, Leishmania</i> and <i>Trypanosoma</i>), Sporozoa (Apicomplexans e.g., <i>Plasmodium, Toxoplasma</i>); ciliophoran (<i>Balantidium</i>)</p> <p>B. Specialized organelles: acidocalcisomes, apicoplast, apical</p>	16/AB

	<p>organelles, hydrogenosomes, glycosomes</p> <p>C. Virulence factors in protozoan parasite, vaccine and drug targets, drug resistance mechanism.</p> <p>D. Molecular mechanisms involved during host-parasite interactions.</p> <p>E. Host immune response to parasitic infections, antigenic variation and immune evasion strategies.</p> <p>F. Recent advances in molecular analysis of host-parasite interactions.</p>	
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**References:**

1. General Microbiology, edition 6th, Roger Y Stanier
2. Prescott's Microbiology, tenth edition, Willey JM, Sherwood LM and Woolverton CJ, McGrawHill, 2017
3. Molecular Parasitology: Protozoan parasites and their Molecules. Walochnik, J, Duchene M, 2016
4. Antimicrobial Drug Resistance: Mechanism of Drug Resistance Volume I (Infectious diseases): 2009, Douglas Mayer
5. Malaria: biology in the era of eradication, 2017, Dyann Ferguson Wirth, CSHL Press