

MICROBIOLOGY

PATHOGEN

- I. PATHOLOGY-THE STUDY OF DISEASE
 - A. DEFINITIONS
 - 1. PATHOGEN (AND HOST)
 - 2. PATHOGENICITY - ABILITY TO CAUSE DISEASE
 - 3. VIRULENCE -DEGREE OF PATHOGENICITY - AND VIRULENCE FACTORS (CAPSULES, FIMBRIAE, ETC.)
 - 4. EXPOSURE, INFECTION AND DISEASE
 - B. PATHOGENS
 - 1. SYMBIOSIS
 - a. COMMENSALISM
 - b. MUTUALISM
 - c. PARASITISM
 - 2. NORMAL & TRANSIENT FLORA (ANTAGONISM)
 - 3. OPPORTUNISTIC ORGANISMS
 - 4. VIRULENT PATHOGENS
- II. VIRULENCE FACTORS
 - A. TOXINS
 - 1. EXOTOXINS -- PROTEINS
 - a. OFTEN BIPARTITE
 - a) ENZYMATIC PORTION (A SUBUNIT)
 - b) CELL-BINDING PORTION (B SUBUNIT)
 - b. EXAMPLES: DIPHTHERIA, BOTULISM, TETANUS
 - c. ENTEROTOXINS: CHOLERA & STAPH
 - d. ANTITOXINS & TOXOIDS
 - 2. ENDOTOXIN --LPS OF GRAM NEGATIVE CELLS
 - a. INTERACTS WITH CD14 CELLS (MONOCYTE LINE)
 - b. INDUCES IL-1 --> FEVER
 - c. INDUCES TNF α , IL-6 & -8 --> SEPTIC SHOCK
 - d. COMPLEMENT AND COAGULATION CASCADES TRIGGERED
 - B. EXTRACELLULAR ENZYMES
 - 1. CELL LYSINS
 - a. LEUKOCIDINS
 - b. HEMOLYSINS
 - 2. DEGRADATIVE ENZYMES
 - a. FIBRINOLYSINS ("KINASES")
 - b. HYALURONIDASES
 - c. COLLAGENASES
 - C. ANTI-PHAGOCYTOSIS
 - 1. INHIBITION OF INGESTION
 - a. CAPSULES
 - b. SURFACE PROTEINS--M PROTEIN OF STREP
 - 2. INHIBITION OF KILLING
 - a. MECHANISM IS OBSCURE
 - b. FACULTATIVE INTRACELLULAR PATHOGENS
 - c. EG., MYCOBACTERIA, LEGIONELLA, LISTERIA
 - D. ADHERENCE
 - 1. FIMBRIAE (or PILI)
 - 2. GLYCOCALYX
 - 3. ADHESINS & INVASINS
 - E. PATHOGENICITY ISLANDS - CONTINUOUS DNA SEQUENCE
 - 1. PLASMIDS
 - 2. CHROMOSOMAL INSERTIONS
 - F. LYSOGENIC CONVERSION - TEMPERATE PHAGE GENES
 - DIPHTHERIA TOXIN