

PLAGUES IN MAN

THE PATHOGEN

- I. PATHOGENS
 - A. SYMBIOSIS (HOST/SYMBIONT RELATIONSHIPS)
 - 1. COMMENSALISM
 - 2. MUTUALISM
 - 3. PARASITISM
 - B. NORMAL & TRANSIENT FLORA (ANTAGONISM)
 - C. OPPORTUNISTIC ORGANISMS
 - D. VIRULENT PATHOGENS
- II. PHYSICAL PROPERTIES OF PATHOGENS
 - A. VIRUSES, BACTERIA, EUKARYOTES, PRIONS
 - B. GROWTH PROPERTIES:
 - MANY GROW ONLY IN OR ON A HOST
 - REQUIREMENTS FOR GROWTH
 - GROWTH RATE
 - C. STABILITY IN THE ENVIRONMENT (SPORES)
 - D. EASE OF TRANSMISSION
- III. VIRULENCE FACTORS
 - A. TOXINS
 - 1. EXOTOXINS -- PROTEINS
 - a. OFTEN BIPARTITE
 - 1) ENZYMATIC PORTION (A SUBUNIT)
 - 2) 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-PHAGOCYTTIC FACTORS
 - 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. E.G., MYCOBACTERIA, LEGIONELLA, LISTERIA
 - D. ADHERENCE
 - 1. FIMBRIAE (or PILI)
 - 2. GLYCOCALYX (DEXTRANS OF *S. mutans*)
 - 3. ADHENSINS (fimbriae/pili)
 - 4. INVASINS