PLAGUES IN MAN

THE PARASITE

I. PATHOGENS
   - A. SYMBIOSIS
     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 TNFα, 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-PHAGOCYTIC 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