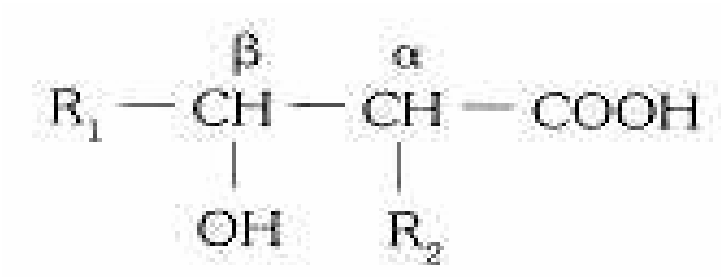
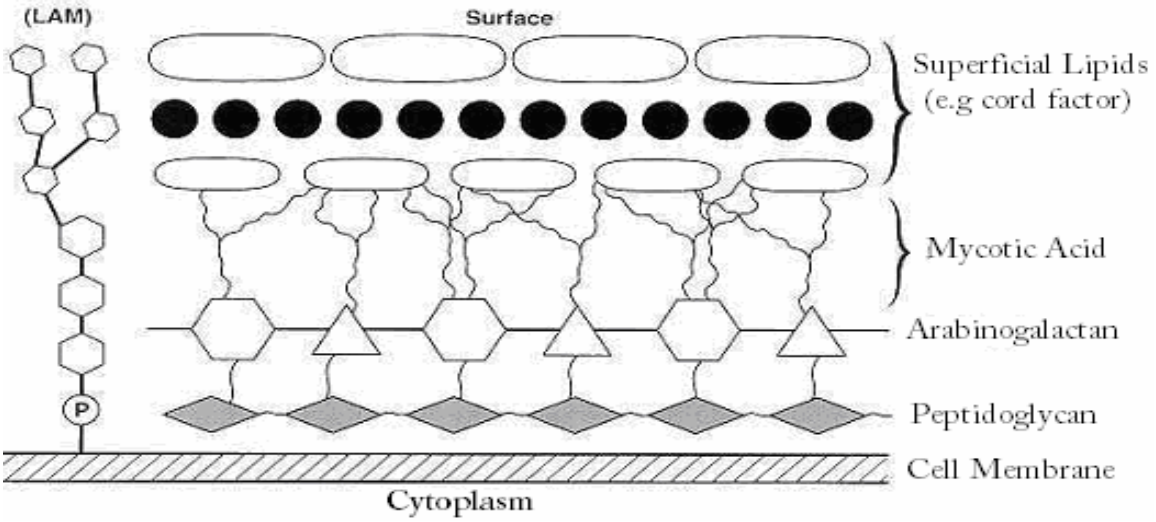
The Mycobacteria (the Fungus-bacterium)
Tuberculosis and Leprosy *M. tuberculosis* and *M. lepre*



•Mycobacteriaceae → **Mycobacterium** & Nocardia

•Genus is characterized by the presence of long-chained fatty acids → Mycolic acids

•$R_1$and R_2vary from C_{60} to C_{90} in *Mycobacterium*;



- Slender, curved rods
- Hydrophobic
- Acid fast
- The cell wall is composed
  - –mycolic acids
  - –complex waxes
  - –unique glycolipids.

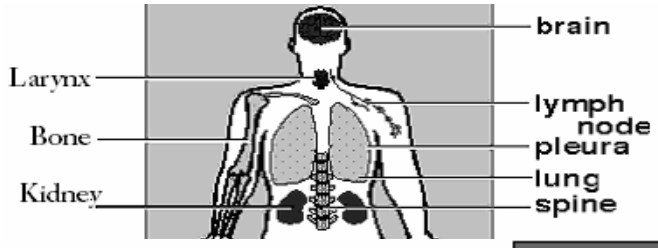
The Mycobacteria

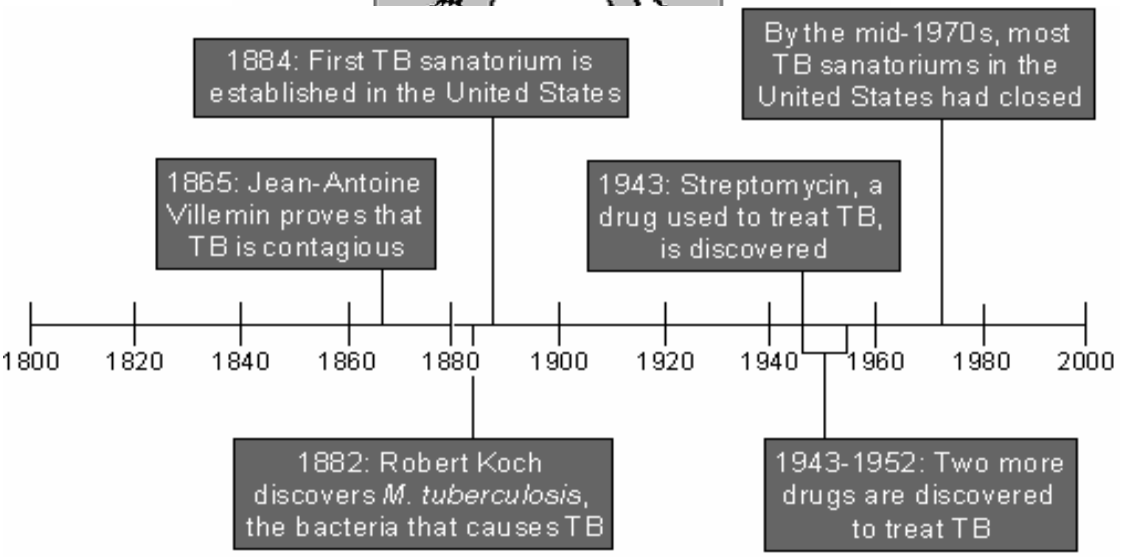
3 main groups.
- –non-pathogenic mycobacteria,
- –**obligate pathogenic mycobacteria**
- –potential pathogenic mycobacteria

Physical Characteristics

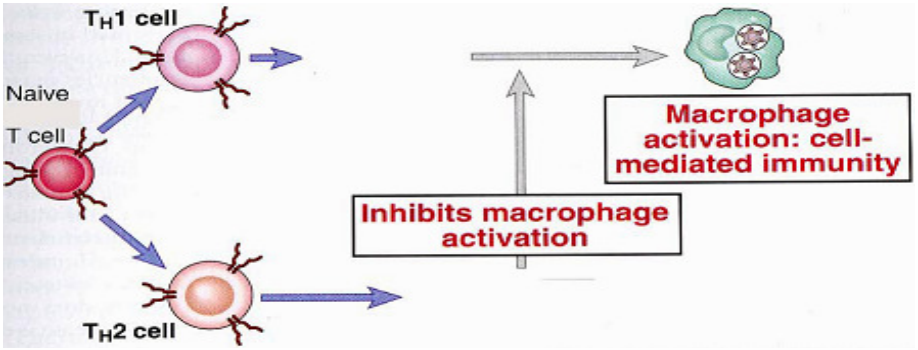
•Highly resistant to trauma and environment
•Gram stain does not work
•Ziehl-Neelsen does
•Slow growth (doubling time (18-24h)

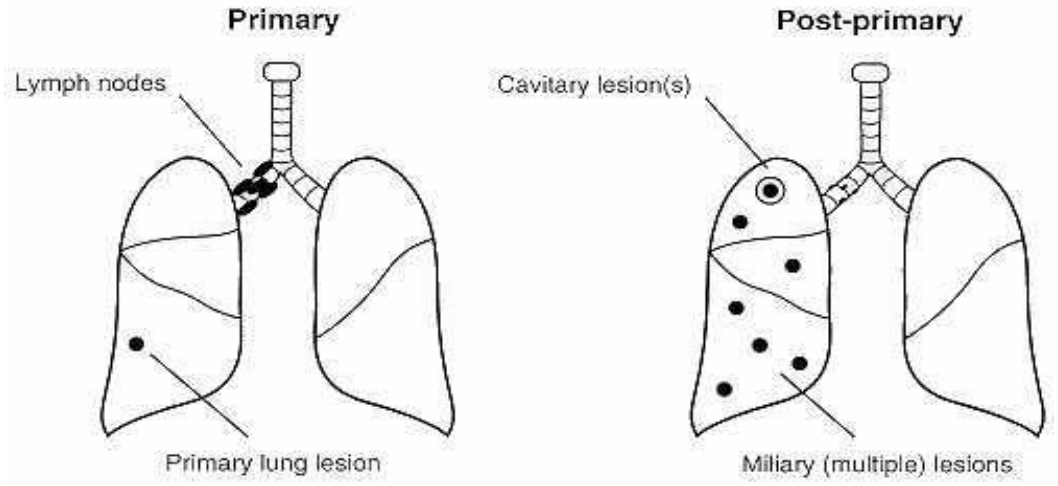
TB disease in different places in the body

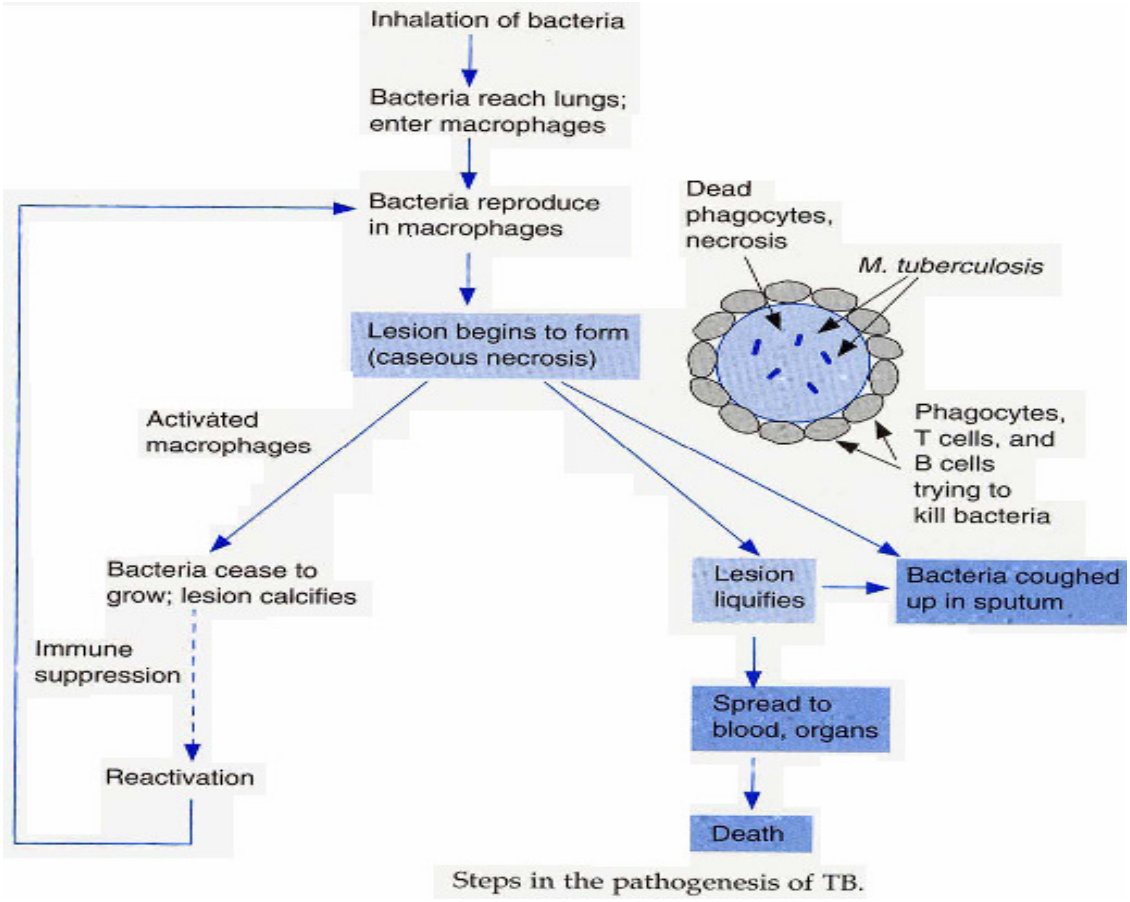




Pathogenesis

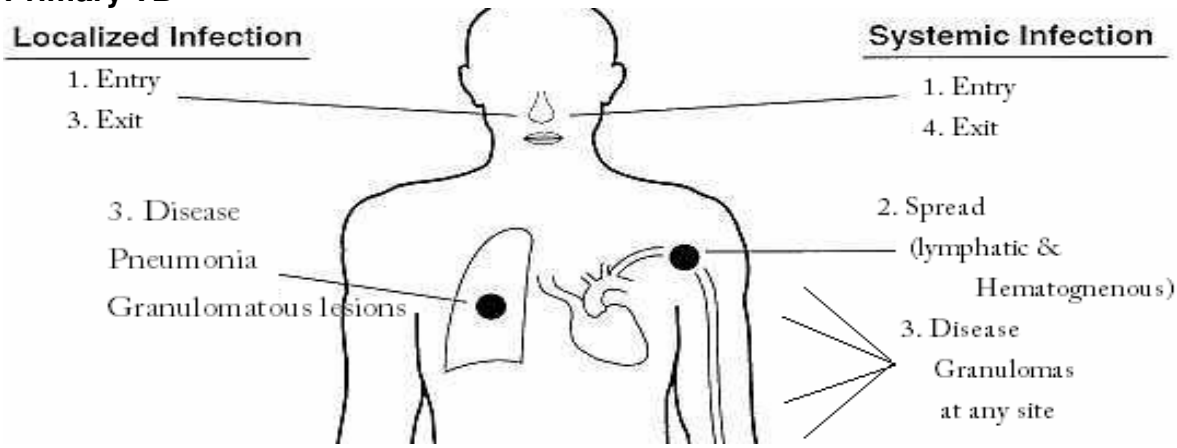






Steps in the pathogenesis of TB.

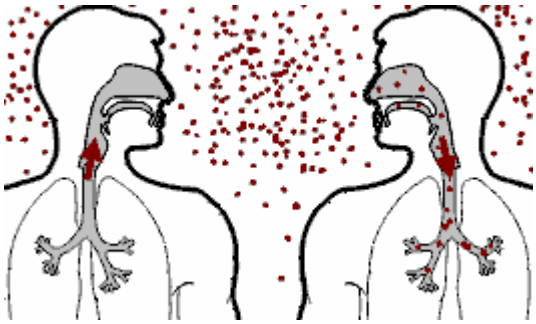
Primary TB

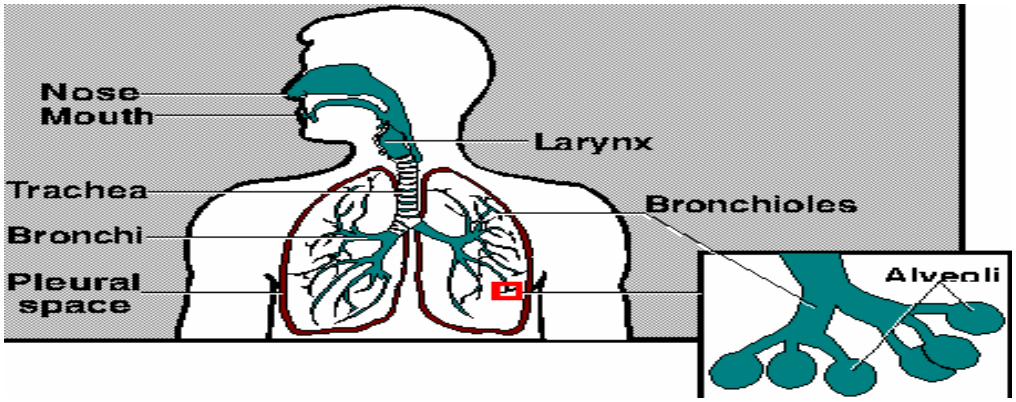


Post Primary TB

- Endogenous reactivation or exogenous re-infection
- Lesions
- Open / infectious case

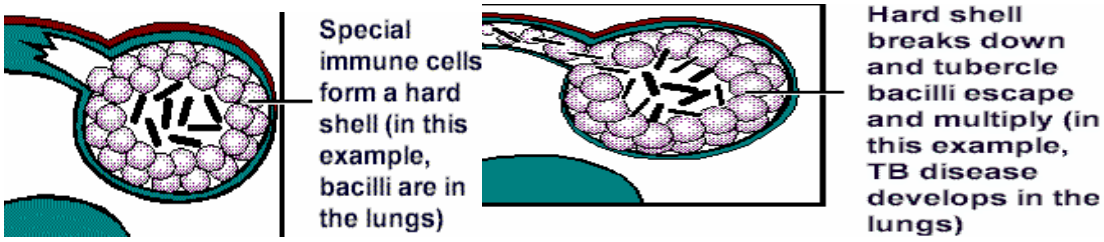
Transmission of TB





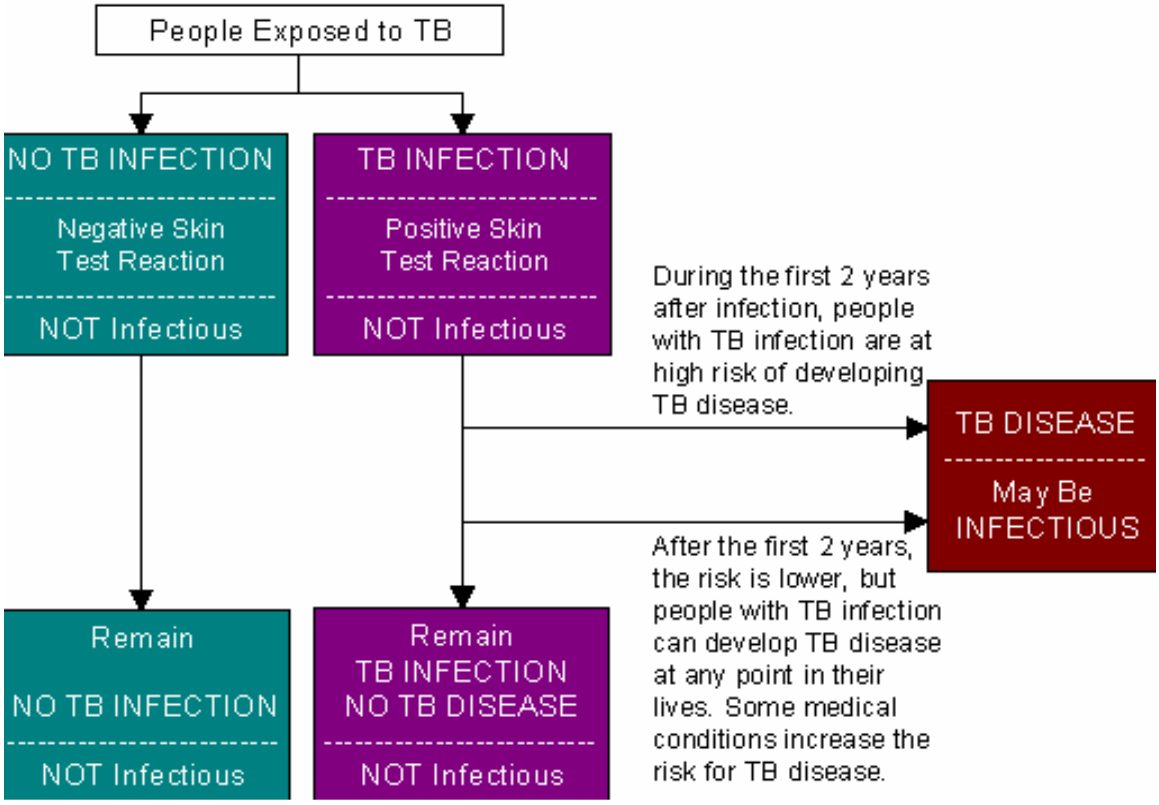
Pathogenesis of TB infection and disease

1. Droplet nuclei containing tubercle bacilli are inhaled, enter the lungs, and travel to the alveoli.



Progression of TB

•People who are exposed to TB may or may not develop TB infection.
•People with TB infection may or may not develop TB disease.
•The risk of developing TB disease is highest in the first 2 years after infection.



Other Mycobacteria

•*M. bovis* → tuberculosis in cattle
•*M. lepre* → leprosy

Leprosy *M. lepre*

•Hansen's Disease
•*Mycobacterium leprae*.
•Leprosy has two common forms
– tuberculoidand lepromatous
– Both forms produce lesions on the skin

Symptoms

•Hypopigmentation
–Loss of sensation
–Chronic skin lesions
–Muscle weakness

•Leprominskin test

•Several forms of leprosy
•Prodromalsymptoms generally slight
•Classification
–Indeterminate
–Tuberculoid
–Borderline

Disease management

•chemotherapy to stop the infection;
•treatment to minimize potential physical deformities
•physical, social, and psychological rehabilitation.
•Close follow-up

Global leprosy situation 2000