Poorly Gram-Staining Organisms*

ACID FAST

Mycobacteria

M. tuberculosis
- Gram (+) wall but doesn't stain due to waxy CW
- Acid fast, obligate aerobe
- Respiratory transmission
- Pathogen, contagious
- Cord factor-trehalose mycolate-inhib. WBC migration mitoch. resp./ oxid. phosphor
- Sulfatides-inhib. phagosome-lysosome fusion
- Niacin (+), catalase (+) at 37˚C, (–) at 68˚C
- Slow growing
- Drug resistance
- Lowenstein-Jensen medium
- DOC: isoniazid + rifampin + pyrazinamide (2 mo) then isoniazid + rifampin (4 mo)

M. avium-intracellulare
- Gram (+) wall but doesn't stain due to waxy CW
- Acid fast
- Obligate aerobe
- Soil organism
- Opportunist, non-contagious
- Pulmonary → diss infections CA pts, late AIDS pts

M. leprae
- Obligate intracellular bacterium
- Tuberculoid (CMI damage)
- Lepromatous leprosy (poor CMI)
- DOC: dapsone + rifampin + clofazimine

M. marinum
- Cutaneous lesions (fish tank granuloma)
- DOC: isoniazid, rifampin, ethambutol

SOME ATP

Rickettsias

R. rickettsii
- Obligate intracellular bacteria
- Gram-negative envelope but stain poorly
- Rocky MT Spt'd Fever-rash on wrists/ankles → trunk, palms, soles
- Vector: *Dermacentor* tick
- Reservoirs: ticks, wild rodents
- Dx: serol: 4x incr indir Fl. Ab + Weil-Felix DOC: Doxycycline

R. prowazekii
- Obligate intracellular bacteria
- Epidemic typhus
- Vector: *Pediculus* louse
- Reservoir: humans, squirrel fleas, flying squirrels

Bartonella henselae
- Cat scratch fever
- Bacillary angiomatosis in AIDS

Ehrlichia
- Ehrlichiosis
- Morulae in WBC
- DOC: doxycycline
- *E. chaffeensis*-monocytes + macrophages
- *E. phagocytophila* - PMNs
- *Ixodes* tick

NO ATP, mod. peptidoglycan

Chlamydiaceae

Chlamydia trachomatis
- Obligate intracellular bacteria
- Gram-negative envelope but stain poorly; lack muramic acid
- Elementary body-transmitted
- Reticulate body-intracellular
- Dx: serology or tissue culture growth confirmed by inclusion bodies (Fl Ab, Giemsa, iodine)

Serotypes D-K
- U.S.-Most common bacterial STD (HPV and HSV2 more common)
- Neonatal/adult inclus. conjunct, neonatal. pneumo; urethritis cervicitis, PID, infertility

Serotypes L1, 2, 3
- Lymphogranuloma venereum
- STD in Africa, Asia, S. America

Serotypes A, B, Ba, C
- Trachoma-follic conjunctivitis → conj. scarring, entropion → corneal scarring
- Leading infectious cause blindness
- DOC: Doxycycline or azithromycin

Chlamydophila pneumoniae
- TWAR agent
- Respiratory infections
- Probably very common
- Potential association with atherosclerosis
- DOC: macrolides and tetracycline

Chlamydophila psittaci
- Atypical pneumonia
- Birds (parrots)
- DOC: tetracycline

NO CELL WALL

Mycoplasmas

M. pneumoniae
- Lack cell wall peptidoglycan → non-Gram-staining
- Cholesterol (req'd) in membr.
- Atypical pneumonia in youth and young adults
- Free living (culturable, extracell.)
- Slow growth, special media: Myco-plasma, Eaton's or Hayflick's media-sterols+pur/pyrimidines: mulberry colonies
- Cold agglutinins in 65% cases
- No Penicillins nor Cephalosporins
- DOC: erythromycin, azithromycin

Ureaplasma urealyticum
- Urethritis, prostatitis
- Urease positive
- No cell wall
- DOC: erythromycin or tetracycline

*Also note that *Legionella* and the spirochetes (*Treponema*, *Leptospira*, and *Borrelia*)—all Gram-negative—do not show up reliably with Gram stain.