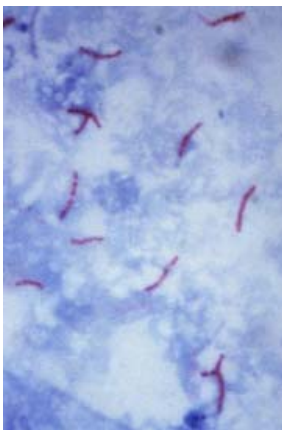
BACTERIAL GROUPS, PART FOUR: GRAM POS, HIGH G+C

TFC, 2nd, p 275-299, 7th: pp324-325, 8th: 324-326 also Jensen & Wright, *Medical Microbiology*
Bergey's Manual of Systematic Bacteriology, (1984) four volumes (See p. 756 for overview)
and Black, *Microbiology Principles and Applications*. Bauman, 4th 561-569
Rvsd 8 Aug93, 8 Aug94, 8 Aug 01, 28 Feb 02, 31 July 2002, 1 Aug 03, 9 Aug 04, 9 Aug 08, 4 Aug09, 2Aug10, 3Aug11, 4Nov15

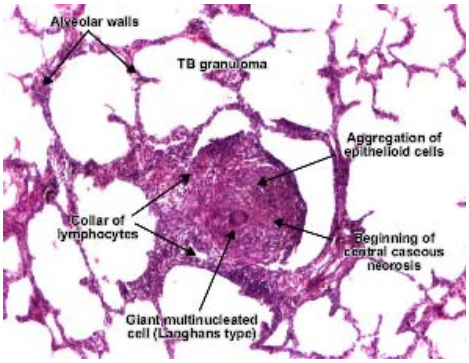
Corynebacterium diphtheriae ("club-rod", "two membranes")(p. 561),
club shaped bacteria in palisades or "V" morphology produced by "snap" fission
toxin lysogen-derived, interferes with protein synthesis throughout body
pseudomembrane forms: conglomeration of bacilli, damaged epithelial, blood cells, fibrin.
produce sequellae: damage to heart, kidneys, NS.
Transmission by droplet **aerosols**, Prevented with **toxoid** in ***D***PT immunization shot.

IRREGULAR, NON-SPORULATING GRAM-POSITIVE RODS, MOSTLY PLEOMORPHIC

MYCOBACTERIA Cell envelopes contain large amounts of lipid: ***acid-fast***. Slender rods. Most are soil dwelling saprophytes.
mycolic acid (wax-like molecule) in cell wall lipids protects fr host defenses and antibiotics.
Infections are walled off by tubercles.

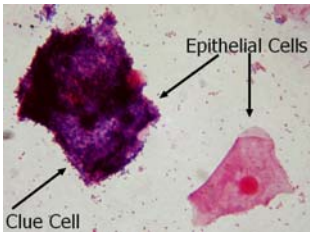


Mycobacteria tuberculosis (p 562-564): 1882: Koch found etiological agent of **consumption.**
Currently, /3rd world pop infected!
Obligate aerobe, requires O_2, **long division time** (18 hrs), therefore **insidious** onset.
aerosol transmission: only those with active lung infections are infectious.
Reproduce *inside* WBC, lyse, release more, spread, cause inflammation, massive necrosis
Can solidify to granulomas. Cause bloody sputum.
tubercles: host walls off with collagen, calcified, viable for years, visible by X ray.
If tubercles break, bacilli disseminate, lead to **miliary** (small grains) **TB**.
Test: **Mantoux Test:** **inject tuberculin intradermally** (antigen from cell wall):
If previously exposed:
PosRxn: delayed hypersensitivity: causes induration (hardening), erythema
Vaccine: BCG (**B**acillus of **C**almette and **G**uerin)
Treatment isoniazid, (inhibits synthesis of mycolic acids), rifampin (inhibits mRNA synthesis)for 1 yr.
MDR-TB are a serious problem, especially in ill-housed prisoners, AIDS PTs



Mycobacteria leprae (p 557)(Hansen's disease)
1st bact. shown to be human pathogen.
Destroys peripheral nerves, skin and mucous membrane.
Prefers cooler parts of body.
***Not* highly contagious**, transmitted only: continual close contact, easily treated.
Two forms:

Tuberculoid (neural)	lose sensation, tubercles surround region
Lepromatous (progressive)	skin cells infected, esp. mucous cells of nose



OTHER HIGH G+C GRAM POSITIVE BACTERIA

Propionibacterium	*P. freudenreichii*	in Swiss cheese, CO_2: holes, propionic acid sharp taste.
	P. acnes	promotes acne, common on skin (p 567)
Gardnerella vaginalis	pleomorphic.	Causes up to ½ cases of **vaginitis**: "clue cells" (bacteria laden), "whiff" test.

ACTINOMYCETES: filamentous, v. common in soil, smell of soil due to these. Two important as source of antibiotics

Streptomyces None pathogenic. Produce over **500 different antibiotics** some effective against bacteria, viruses, protozoans and fungi.

Actinomyces israelii (ray fungus) branching filaments, mainly soil, some in mouth. Some cause jaw abscesses, dental caries or periodontal infections. *A. israelii* causes actinomycosis of head, neck or lungs: tissue destroying

NOCARDIOFORMS: (p 559) aerobic, rudimentary filaments, Gm + pleomorphic, aerobic, usually acid-fast
Nocardia asteroides: pulm. nocardiosis, destroy feet, hands
(note similarity of diseases to *Mycobacterium*)