PROTECTIVE MEDICINE

PATHOGENIC GRAM NEGATIVE COCCI AND BACILLI

Alphaproteobacteria: aerobic, live on low levels of nutrients, many with prosthecæ p 331
- *Acetobacter aceti* (vinegar rod) on substrate of wood shavings, gravel, make acetic acid fr EtOH
- *Rhizobium spp.* (root life) bacteroids symbiotic in legume root nodules, infect roots of legumes, form nodules, fix nitrogen with nitrogenase, convert N₂ to NH₃, etc.
- *Nitrobacter* convert NH₃ to NO₃

Betaproteobacteria: can use diffusible nutrients from decomposition
- *Neisseria*: parasitic on human mucous membrane (fac. anaerobic, Gm- diplococci)
- *N. gonorrhoeae* (p 570) STD, many are PPNG, diagnosis: gm- diplococci in PMN fr purulent urethral exudate
  - Can infect female urethra, uterine Vegas, cervix (false, simple organism) psychrophilic, monotrichous, inhibit cilia
  - *N. meningitidis* (p 573) Contagious in close quarters. PoE: nasopharynx. In blood: meningococcaemia to meningitis. Sore throat, stiff neck, headache, etc. NOTE: ~40% pop. are carriers in nasopharynx

Pathogenic, Gram Negative, Facultative Anaerobic

GAMMA PROTEOBACTION: largest group of proteobacteria, great variety of physiological types
- *Pseudomonas aeruginosa* p 591
  - Isolated from burn & wound infections, infant diarrhea, resistant to many antibiotics, can cause UTI (esp catheterized PTs) burn & wound infections, infant diarrhea, resistant to many antibiotics, causes enterotoxinotic strains cause traveler’s diarrhea (TD) (~50% TD due to E. coli)
  - Enterohemorrhagic strain O157:H7, bloody diarrhea, Jack-in-the-Box, beef contaminant
- *Klebsiella pneumoniae* 574 pediatric septicemia, pneumonia (with bloody sputum) is common nosocomial (CRE) prominent in alcoholic, compromised PTs, wound infections, now “CarbaPENem R. Enter.”
  - *Serratia marcescens* p 579 red pigment in some, opportunistic, nosocomial in debilitated: GU, resp., heart valves, meningitis, formerly used as test of germ warfare.
- *Enterobacter*
  - Com. in soil, GU, nosocomial
- *Proteus vulgaris* p 579 highly motile, norm in fecal flora, incr with antibiotics, can cause UTI (esp catheterized PTs) burn & wound infections, infant diarrhea, resistant to many antibiotics
- *Salmonella* p 581 lac-, common in poultry, turtles, antibiotic-treated cattle,
  - Differentiate by Kauffmann-White serological tests of O (LPS) and H (flagellar) antigens
  - *S. typhi* (584) (storm mouse) gastroenteritis (“food poisoning”), 1-3 days after ingestion of contam. food
  - *S. typhimurium* (storm mouse) gastroenteritis, 1-3 days after ingestion of contam. food
- *Shigella dysenteriae* (582)
  - Inhabits, inflms colon, bloody diarrhea, 2nd most com. in travelers = bacillary dysentery
- *Yersinia pestis* (583)
  - Bubonic (gruin) plague, rapid invsn, overwhelming sepsis. Endemic: SW ground squirrels. Black Death killed 33% of Europe pop. in 14th century. Bubo: p 580 (pneumonic is worst)
  - Pasteurella: very sm. bacilli & coccobacilli, fastidious, non-motile, most parasites, attack mucous membrane
  - *Hemophilus influenzae* p 585 com inhab of upr rsp muc memb. children: otitis media, meningitis (6 mo to 2 yr), etc. (req. blood for growth, need heme and NAD+), 2° infect. p colds, can cause pinkeye.

PATHOGENIC, GRAM NEGATIVE, AEROBIC BACILLI

Bartonella henselae p 587
- Cat scratch fever: bite or scratch, popular lesion, swollen lymph nodes for weeks. 40,000/yr mammal parasite, brucellosis (undulant fever), fr milk, animal fluids. Contag abortn, 200/yr (throughout cough) transmission: resp route, grows on surf trachea & bronchi. 12,000/yr inhibit cilia: p585. Causes whooping cough, vaccine = killed cells in DPT shots

Francisella tularensis: p 588
- Zoonosis, transmitted by flea, tick fr rodents, rabbit fever, tularemia, fever, myalgia

Legionella spp. p 594
- Inhabits warm-water supplies, causes Legionaire's Disease: debilitated persons (29 died) anaerobic: group of normal GI flora, 85% bact Gitis?, can cause peritonitis after surgery

Bordetella pertussis: p 588
- Inhibit cilia: p585. Causes whooping cough, vaccine = killed cells in DPT shots

Bacillus anthracis: p 596
- Inhibits warm-water supplies, causes Legionaire's Disease: debilitated persons (29 died) anaerobic: group of normal GI flora, 85% bact Gitis?, can cause peritonitis after surgery