Family Pasteurellaceae

*Actinobacillus, Mannheimia, Pasteurella
Histophilus, Haemophilus and Taylorella.

**Bordetella

- Actinobacillus spp. have been discussed by Dr. Muckle
- **Bordetella spp. are currently members of the family Alcaligenaceae

Histophilus, Haemophilus and Taylorella

- **Histophilus somni** (previously Haemophilus somnus)
- *Haemophilus influenzae*, *H. parasuis*, *H. paragallinarum*
- Taylorella (prev. Haemophilus) equigenitalis

**Habitat/Epidemiology**
- Upper resp. or genital tract mucosa
- Generally no “off-animal” (saprophytic) existence
- ‘Carrier’ transmission impt.
- Host specificity (single animal target)
- transmission aerosol/contact
Histophilus, Haemophilus and Taylorella

- **Microscopic/Culture Morphology**
  - small G-ve rods/coccobacilli, filaments
  - Fastidious – Facultative anaerobes, enriched media for initial isolation, small "dewdrop" colonies
  - 5- 10% CO₂ enhance growth (capnophilic)

Histophilus, Haemophilus and Taylorella

- Growth factors “X” (hemin) or “V” (Nicotinamide Adenine Dinucleotide - NAD) requirement for some species/biotypes
  - *H. parasuis*, *H. paragallinarum* (require Factor V)
  - *H. somni* does not
  - *S. aureus* (“feeder” streak) – satellite colonies
  - Chocolate agar - is media with RBC’s lysed – *S. aureus* not req’d

- **Recall** - *Actinobacillus pleuropneumoniae* (APP) : Biotype I (serotypes 1-12) – require Factor V and Biotype II (serotypes 13 + 14) do not
**Histophilus somni**

- **Habitat/Transmission**
  - Genital tract, upper resp. mucosa
  - Direct contact, aerosols (urine), semen
- **Disease (feedlot cattle)**
  - Infectious Thromboembolic Meningoencephalitis (ITEME)
  - **peracute** (death)
  - **subacute** - fever, knuckling, somnolence, blindness (retinal), coma, death
  - Septicemia → localization in CNS (cerebrum, midbrain, meninges)
  - vascular endothelial damage → thrombosis, necrosis, hemorrhage, meningitis and encephalitis
  - facultative intracellular pathogen

**Histophilus somni**

- **Other Disease Conditions**
  - Bronchopneumonia
  - Endometritis and abortion
  - Myocarditis, arthritis
- **Diagnosis (Dx)**
  - ITEME → Histopath → *H. somni* in brain lesions
  - Culture: Blood, visceral organs
  - BA (5-10% CO₂)
- **Treatment (Tx) and Prevention**
  - Vaccines available:
  - Antibiotics – ITEME early
  - TMS, Ceftiofur, Florfenicol
  - I.D. infected/carrier bulls
    - Cull or preputial disinfection
    - semen culture (ELISA serology)
Haemophilus parasuis

• Glässers Disease - swine
  – Less impt than A. pleuropneumoniae
  – part of normal nasopharyngeal flora – early colonizer post-partum

• Pathogenesis
  – Stress → septicemia (fever)
  – polyserositis (respiratory and/or cardiac distress)
  – polysynovitis - arthritis
  – Also, purulent bronchopneumonia or meningitis following septicemia

H. parasuis

• Control - Management
  – All-in, All-out
  – MEW better than SEW
  – Vaccines available
    • no cross protection, 15 serotypes
  – Suvaxyn® (Wyeth)
    • serovars 4 + 5
    • Piglets, growers, breeders

• Useful Antibiotics
  • Penicillin, Tetracycline, TMS
  • Determining MIC useful
**Avibacterium (prev. Haemophilus) paragallinarum**

- **New Genus name**
- **Fowl/Infectious Coryza**
  - Widespread, frequently assoc. with viral infect'ns
  - Signs: facial/wattles swelling
  - acute serous/mucoid rhinitis, sinusitis and conjunctivitis
- **Control**
  - Serology to i.d. exposed animals
  - Bacterin vaccines
  - Pen, Tet or spectinomycin in water

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**Taylorella equigenitalis**

- Exotic to N.A. (UK, Europe, Japan), reportable in N.A.
- **Contagious Equine Metritis (CEM)**
  - Stallions carry – no clinical signs
  - Neutrophil infiltration into uterus
  - Endometritis, cervicitis, vaginitis 2-12 days post-service
  - Temporary infertility in mares
  - Copious vaginal muco-purulent discharge 7-10 days
  - Stringent Import/Export animal testing
    - Mares - triple culture clitoral fossa.
    - Stallions – triple culture penis, test-mating
  - Abx : Systemic TMS and topical (uterine, clitoral, penile) treatment
  - No vaccines
**Bordetella spp.**

- Family *Alcaligenaceae*
- *B. pertussis, B. bronchiseptica, B. avium*
- Strict aerobes, Gram–ve short rods/coccobacillary, BA +ve (+/- hemolysis) MAC +ve (NLF)
- Emerging zoonoses in immunocomp. people

- **B. bronchiseptica:** not “normal” flora
  - Dogs → **“Kennel Cough”, Infectious Tracheobronchitis (ITB)**
  - Secondary invader to viruses: CpiV, CAV-2, CDV
  - Bacteria: *Mycoplasma spp. /S. canis /P. aeruginosa /Pasteurella*
  - High morbidity, self-limiting (1-3 wks), shedding 3 months
  - Signs: “honking” cough, retching, +/- fever, nasolacrimal discharge
  - bronchopneumonia can develop immunocompromised (virus)

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**Kennel Cough**

- Virulence factors: **Four Exotoxins**, pili, LPS
  - **Tracheal toxin** (ciliated resp. epithelial cells)
  - **Adenylate cyclase - hemolysin** (leukocytes)

- **Dx**
  - Signs (no fever), culture of tracheal aspirate
  - Selective media for oropharyngeal swabs
  - BA (var. hem), MAC +ve (NLF – but pinkish/tan color), motile, CAT/OX/Urease +ve

- **Control:**
  - Vaccines (Intra-Trac® ADT II→ Bb + CpiV) I.N.
  - Clavamox, **Doxycycline**, Enrofloxacin
**Bordetella bronchiseptica**

- **Other Animals Infected**
  - **Cats** → primary pathogen (dogs source)
  - Typically resp. as per dog
  - Kittens < 10 wks → severe bronchopneumonia, septicemia, cyanosis, death
  - **Dx** – as per dogs
  - Vaccine (US): **Protex®-Bb** (Intervet) – intranasal modified live
  - **Abx**: Doxycycline is drug of choice in absence of MIC
**Bordetella bronchiseptica**

- **Other Animals Infected**
  - **Swine** → Non Progressive Atrophic Rhinitis NPAR
    - More severe Progressive form (PAR) if *Pasteurella multocida* (Type D) involved
  - **Signs:**
    - NPAR – subclinical to mild upper resp. signs, +/- epistaxis, +/- turbinate atrophy, rarely snout malformations
  - **Dx** → based on signs, culture (BA +ve, MAC +ve/NLF)
  - Management: all-in-all out, SEW/MEW, ventilation/ammonia
  - Vaccines available – typically with P. multocida
  - Antibiotics → Sulphonamides prophylaxis

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**B. avium**

- **Avian bordetellosis – Turkey Coryza**
  - High morbidity, low mortality
  - Turkey poults (1-6 wks) chickens also
  - Sneezing, conjunctivitis, submandibular edema, **open-mouthed breathing**, anorexia, **tracheal collapse**, stunted growth (over 1-3 wks)
  - Older animals less susceptible
  - **Dx:** signs, culture trachea/air sac, PCR, serology
  - **Control**
    - Biosecurity (all-in-all-out), foot baths, air quality
    - Vaccines – breeder hen vaccination + poults works
    - Pen + Tet in H₂O efficacy ? Niacin supplement