

Haemophilus : is a genus of Gram-negative, pleomorphic, coccobacilli bacteria belonging to the Pasteurellaceae family. While *Haemophilus* bacteria are typically small coccobacilli, they are categorized as pleomorphic bacteria because of the wide range of shapes they occasionally assume. These organisms inhabit the mucous membranes of the upper respiratory tract, mouth, vagina, and intestinal tract. The genus includes commensal organisms along with some significant pathogenic species such as *H. influenzae*—a cause of sepsis and bacterial meningitis in young children—and *H. ducreyi*, the causative agent of chancroid. Transmitted via respiratory droplets, or direct contact with contaminated secretions. Normal flora of the human respiratory tract and oral cavity.

Metabolism

Chocolate agar is an excellent *Haemophilus* growth medium, as it allows for increased accessibility to these factors. Alternatively, *Haemophilus* is sometimes cultured using the "Staph streak" technique: both *Staphylococcus* and *Haemophilus* organisms are cultured together on a single blood agar plate. In this case, *Haemophilus* colonies will frequently grow in small "satellite" colonies around the larger *Staphylococcus* colonies because the metabolism of *Staphylococcus* produces the necessary blood factor byproducts required for *Haemophilus* growth.

Bordetella :is a genus of small (0.2 – 0.7 µm), Gram-negative coccobacilli of the phylum Proteobacteria. *Bordetella* species, with the exception of *B. petrii*, are obligate aerobes, as well as highly fastidious, or difficult to culture. All species can infect humans. The first three species to be described (*B. pertussis*, *B. parapertussis*, *B. bronchiseptica*,); are sometimes referred to as the 'classical species'. One of these (*B. bronchiseptica*) is also motile.

B. pertussis and occasionally *B. parapertussis* cause pertussis or whooping cough in humans, and some *B. parapertussis* strains can colonise sheep. *B. bronchiseptica* rarely infects healthy humans, though disease in immunocompromised patients has been reported. *B. bronchiseptica* causes several diseases in other mammals, including kennel cough and atrophic rhinitis in dogs and pigs, respectively. Vaccine:DTP vaccine .The *Bordetella* genus is named after Jules Bordet.

Pathogenesis

The most thoroughly studied of the *Bordetella* species are *B. bronchiseptica*, *B. pertussis* and *B. parapertussis*, and the pathogenesis of respiratory disease caused by these bacteria has been reviewed. Transmission occurs by direct contact, or via respiratory aerosol droplets, or fomites. Bacteria initially adhere to ciliated epithelial cells in the nasopharynx, and this interaction with epithelial cells is mediated by a series of protein adhesins. These include filamentous haemagglutinin, pertactin, fimbriae, and pertussis toxin (though expression of pertussis toxin is unique to *B. pertussis*). As well as assisting in adherence to epithelial cells, some of these are also involved in attachment to immune effector cells. Treatment : Erythromycin