

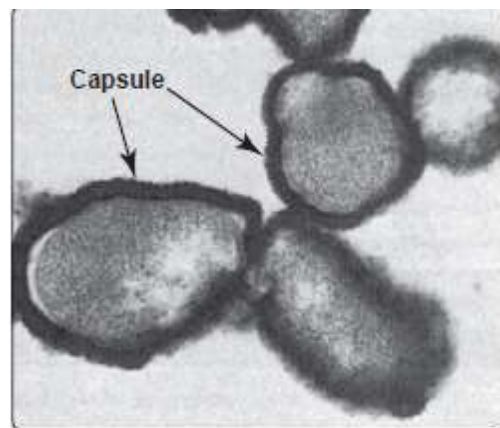
Genus *Haemophilus*

General characters:

Cells of *Haemophilus influenzae* are pleomorphic, ranging from coccobacilli to long, slender filaments. *H. influenzae* may produce a capsule (six capsular types have been distinguished) or may be unencapsulated, unusual gram-negative bacteria .

The capsule is an important virulence factor. Serious, invasive *H. influenzae* disease is associated particularly with **capsular type b (Hib)**, which is composed of **polyribose phosphate**.

Hib is especially important as a pathogen of young children, although it can cause disease in individuals of all age groups. **Nontypeable** (unencapsulated) strains may also cause serious disease and are a significant cause of **pneumonia** among older adults and individuals with chronic lung disease.



Growth factors:

Requires growth factors X (hemin) and V (NAD) for growth on Nutrient or blood agar .

virulence factor:

Polysaccharide capsule (type b capsule is polyribitol phosphate) most important virulence factor

- Capsule important in diagnosis; **antigen screen on CSF** (e.g., latex particle agglutination); serotype all isolates by quellung.
- **IgA protease** is a mucosal colonizing factor.

Immunity : Conjugate capsular polysaccharide-protein vaccine

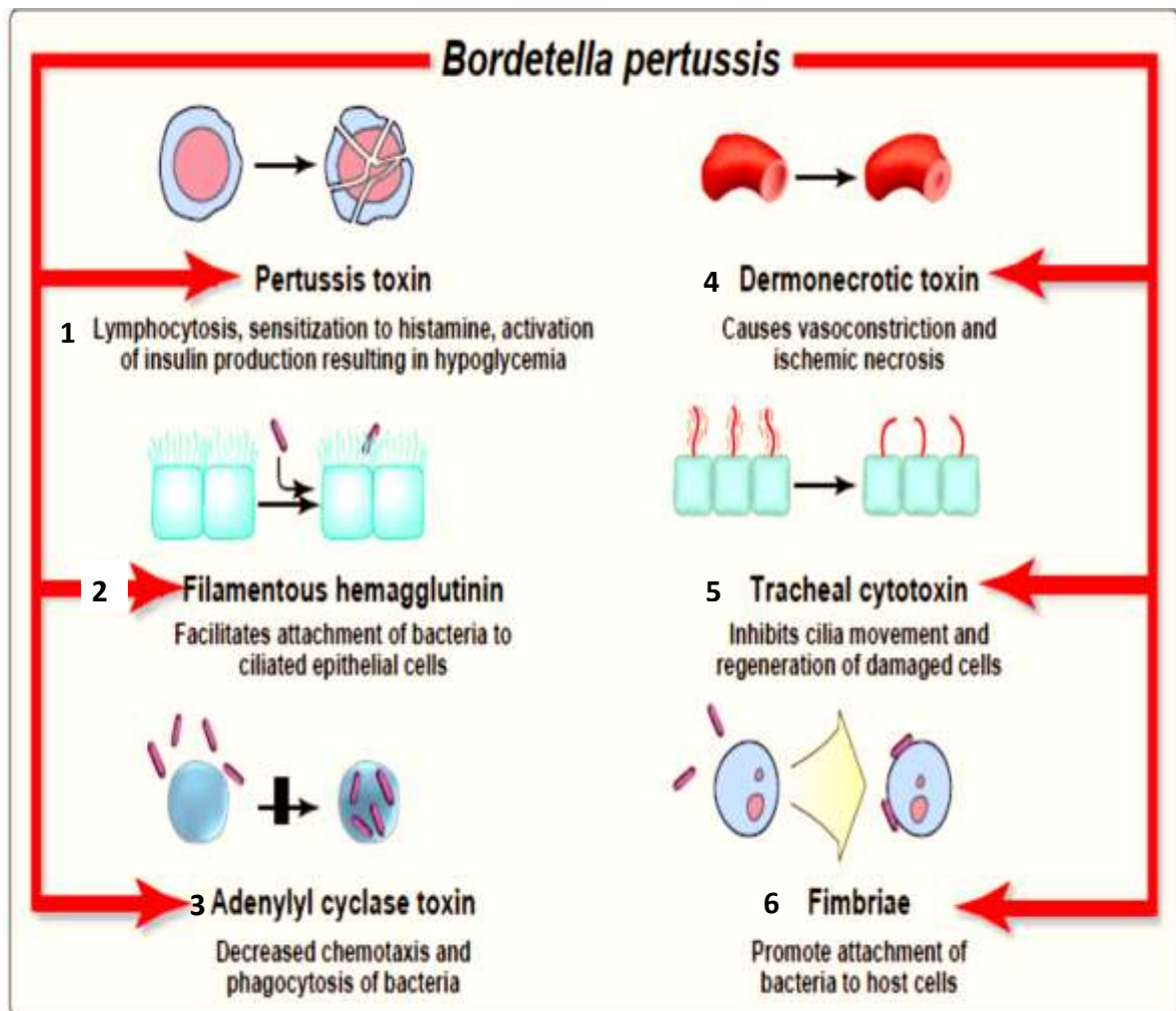
Vaccination effective to prevent type b disease.

Genus *Bordetella*

General characters:

small **gram-negative**, aerobic **rods**; encapsulated organism can cause the disease **pertussis** (also known as **whooping cough**), They can be serotyped on the basis of cell-surface molecules including adhesins and fimbriae.

B. pertussis binds to ciliated epithelium in the upper respiratory tract (see Figure). There, the bacteria produce a variety of toxins



Immunity:

vaccine DTaP (acellular pertussis: filamentous hemagglutinin plus pertussis toxoid); immunity wanes 5–7 years; babies are born with little or no immunity (IgA) from mother.