



**GV-SOLAS**

Gesellschaft für Versuchstierkunde  
Society for Laboratory Animal Science

# **Expert Information**

**from the Working Group on Hygiene**

**Implication of infectious agents on  
results of animal experiments**

***Bordetella pseudohinzii***

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## ***Bordetella pseudohinzii***

### **Background**

- *Bordetella* spp. of laboratory mouse, closely related to *B. hinzii*, described for the first time as *B. pseudohinzii* by Ivanov et al. 2016<sup>1</sup>
- It was previously reported in laboratory mice as *B. hinzii*.<sup>2-7</sup>

### **Prevalence**

- World-wide distributed in laboratory mice<sup>8-10</sup>
- Reported in 2.8% of the facilities and 1.6% of the examined mice in Japan. Nevertheless, 32% of the mice originating from the contaminated facilities were positive.<sup>3</sup>
- In a contaminated European mouse colony, the prevalence was very high (93%).<sup>8</sup>

### **Host species**

- Laboratory mouse
- Asian house rat (*Rattus tanezumi*) in south-eastern Asia<sup>11-12</sup>

### **Properties**

- Survives on paper bedding in an animal room environment for at least 2 weeks<sup>13</sup>

### **Susceptibility**

- No data

### **Organotropism**

- Respiratory tract

### **Clinical disease**

- Natural infection in mice can display sneezing and a chattering sound but without nasal discharge.<sup>2</sup>
- Experimental infection induced sneezing in ICR mice and sneezing and slight to severe dyspnea in NOD-SCID mice.<sup>2</sup>
- No obvious clinical symptoms but elevated numbers of neutrophils in bronchoalveolar lavage fluid and inflammatory signs in histopathology in C57BL/6J mice<sup>8</sup>

### **Pathology**

- Histopathologic examination revealed rhinitis, tracheitis, and bronchopneumonia after natural infection; NOD-SCID mice displayed additionally interstitial pneumonia after experimental infection.<sup>2</sup>
- Inflammatory signs of the respiratory tract in histopathology such as tracheitis with reduced numbers of ciliated cells, multifocal bronchointerstitial pneumonia with dominating neutrophils and macrophages in major airways and alveolar spaces<sup>8</sup>
- Mild to moderate rhinitis and increased percentage of neutrophils in the bronchoalveolar lavage fluid of mice<sup>9</sup>

- Acute and chronic histopathological changes of otitis media<sup>14</sup>

### **Morbidity and mortality**

- No data

### **Zoonotic potential**

- No reports for *B. pseudohinzii*, but the closely related *B. hinzii* is able to induce disease such as fever, bacteraemia and endocarditis in immunosuppressed humans.<sup>15</sup>

### **Interference with research**

#### ***Oncology***

- No data

#### ***Teratology***

- No data

### ***Infectiology / Interactions with other infectious agents***

- No data

#### ***Immunology***

- No data

#### ***Toxicology***

- No data

#### ***Physiology***

- Tracheal inflammation with reduced numbers of ciliated cells, slower ciliary beat frequency, and largely (>50%) compromised cilia driven particle transport speed on the mucosal surface, a primary innate defense mechanism<sup>8,9</sup>
- Progressive decrease in hearing acuity<sup>14</sup>

#### ***Cell biology***

- In an in vitro model, *B. pseudohinzii* attached to respiratory kinocilia, impaired ciliary function within 4 h and caused epithelial damage within 24 h.<sup>8</sup>

### ***Assisted reproductive technology***

- No data

### **Special considerations**

- Controlled infection with *B. pseudohinzii* may serve as an experimental model to investigate mechanisms of mucociliary clearance and microbial strategies to escape from this primary innate defence response.<sup>8</sup>
- Natural model of otitis media in mice, permits the study of colonization of the middle ear through the Eustachian tube and of the pathogenesis of otitis media<sup>14</sup>

Laurentiu Benga, Düsseldorf, November 2019

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