Pneumonia in a rat

Keywords
enrofloxacin; pneumonia; rat

Case summary
A 1-year old, male castrated albino pet rat presented with acute-onset dyspnoea, lethargy and anorexia. Despite treatment with enrofloxacin and meloxicam, the animal died 2 days later. Three weeks later, a similar case was observed in the same population of rats. During autopsy, mainly lesions on the lungs were prominent (Fig. 1).

Discussion
Correct answer: 2. Corynebacterium kutscheri.

*Corynebacterium kutscheri* was first described in 1894 by Dr D. Kutscher and designated 'Bacillus pseudotuberculosis murium'. The gross lesions caused by *C. kutscheri* generally consist of multiple randomly distributed abscesses in the lungs or other internal organs and can be very similar to mycobacterial lesions (hence the name 'pseudotuberculosis'). It has been shown that healthy rats frequently carry *C. kutscheri* along their gastrointestinal, upper respiratory and urogenital tracts (Amao *et al.*, 1995), which means that skin and soft-tissue infections due to this bacterium are possible after a rat bite (Holmes and Korman, 2007). A variety of predisposing factors such as age, malnutrition, stress and other infections can resuscitate a latent infection to become clinical in carrier rats.

The remaining three answer options are actually the same disease. It is only very recently that Livingston *et al.* (2011) and Henderson *et al.* (2012) explicitly showed that the putative viral agent referred to as ‘rat respiratory virus’ causing lung lesions referred to as ‘idiopathic interstitial pneumonia’ actually does not exist. Using both retrospective studies and experimental infection studies, it was shown that it was actually *Pneumocystis carinii*, a single-celled air-borne fungal respiratory pathogen, that is the aetiological agent of this disease. *P. carinii* can be latently present in immunocompetent rats but can cause severe disease in immunosuppressed individuals. The rat-associated *P. carinii* should not be confused with the human-associated *Pneumocystis jiroveci*, formerly known as *P. carinii* (Stringer *et al.*, 2002).

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**Question**

What is the presumptive cause of pneumonia in the current case?

**Answer options**

1. Rat respiratory virus
2. *Corynebacterium kutscheri*
3. *Pneumocystis carinii*
4. Idiopathic interstitial pneumonia

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**Fig. 1.** *In situ* appearance of the internal organs of a rat with respiratory symptoms. The scalpel indicates the affected lungs.
References


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