

Scientists discover bacteria that can cause bone infections

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Scientists have discovered that a bone infection is caused by a newly described species of bacteria that is related to the tuberculosis pathogen. The discovery may help improve the diagnosis and treatment of similar infections, according to an article published in the October issue of the *International Journal of Systematic and Evolutionary Microbiology*.

Some rare genetic diseases can make patients susceptible to infections with *Mycobacterium* species, the bacteria that amongst other diseases, cause tuberculosis and leprosy. These patients often suffer from recurring mycobacterial infections throughout their whole lives. Because of this, researchers are trying to identify unusual species that cause disease in order to improve treatment strategies.

"We isolated an unknown species of bacteria from a 7 year old child who has a genetic immune defect," said Dr Didi Bang from Statens Serum Institut in Copenhagen, Denmark. "The infection had caused bone lesions and this is where we found the newly described bacteria."

Mycobacterial infections can be very difficult to treat. The bacteria have unique cell walls that protect them from several antibiotics. As well as being resistant to treatment, they can also survive attack with acids, alkalis and detergents. Most mycobacterial infections can be treated with antibiotics such as clarithromycin and rifamycins, but some species are becoming resistant to these antibiotics, so new drugs for treatments must be developed.

"Initial tests suggested we had found a Mycobacterium. By sequencing some of the bacterium's genes we showed that we had discovered an undescribed species," said Dr Bang. "We called the bacterium Mycobacterium arosiense. The name comes from Arosia, the Latin name of the city of Aarhus in Denmark, which is where the bacterium was first found. We showed the position of the new bacterium on the Mycobacterium family tree by sequencing genes and comparing them to related bacteria."

The new pathogen is closely related to Mycobacterium intracellulare and Mycobacterium avium, which cause a lung disease similar to tuberculosis in people, especially those with weak immune systems such as HIV patients that are immunologically suppressed. It is rod-shaped and grows slowly.

"Mycobacterium arosiense can be killed by several antibiotics in the lab, including clarithromycin and rifamycins. However, resistance to fluoroquinolones and isoniazid was observed," said Dr Bang. "Little knowledge is available on performing resistance tests on mycobacteria other than tuberculosis."

"We hope that this discovery will help doctors to diagnose similar diseases in the future and that further investigation may improve the treatment of people with similar infections."

Source: Society for General Microbiology

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