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Molecular diagnosis of infection with *Bartonella spp.*

This assay detects bacterial DNA belonging to the *Bartonella* genus, at least eight species of which have been known to cause disease in humans. The most clinically significant of these is *Bartonella henselae* which is the pathogen responsible for Cat Scratch Disease (also known as 'catch scratch fever', 'Teenys Disease', 'Inoculation lymphoreticulosis' and 'subacute lymphadenitis').

Although found as a commensal in many wild animals, *Bartonella henselae* is most commonly transferred to humans from cats (particularly kittens) and is thought to infect humans by flea faecal contamination of cat scratches. Infected individuals my present with low-grade fever, enlarged tender lymph nodes that develop 1-3 weeks after exposure and/or a papule or pustule at the inoculation site.

In most cases of cat scratch disease, infection will be resolved without treatment; however some patients may develop complications from disseminated disease. It is therefore of clinical interest to be able to recognise infection so that antibiotics can be prescribed where appropriate. Azithromycin in particular has been shown to decrease lymph node volume more rapidly compared to no treatment [1].

Also medically significant is *Bartonella quintana*, the pathogen responsible for Trench fever during WWI (also known as 'Meuse Fever', 'Wohlhynia Fever' and 'Quintan Fever'). *Bartonella quintana* is passed to humans via a louse vector, and is thus most often found in those living under poor conditions; for example homelessness. Symptoms of infection with *Bartonella quintana* include: fever, headache, rash and bone pain, mainly in the shins, neck and back.

In some cases, bacillary angiomatosis (caused by *B. henselae* or *B. quintana*) and bacillary peliosis (caused by *B. henselae*) occur in immunocompromised people, such as those with advanced HIV infection. Bacillary angiomatosis may present as lesions in the skin, subcutaneous tissue, bone, or other organs. Bacillary peliosis causes vascular lesions in the liver and spleen [2].

Many *Bartonella* species can cause subacute endocarditis (infection of the heart valves), which is often culture negative. In these cases, PCR detection testing can prove extremely useful in the identification of the causal agent.

Micropathology Ltd uses nested PCR with visualization by agarose gel electrophoresis for the qualitative detection of *Bartonella* species. Clinically relevant sample types for *Bartonella* detection include blood, tissue, lymph node aspirates and pus [1,3]. This assay has been validated to detect *Bartonella spp.* DNA in whole blood and tissue specimens to ISO15189:2012 standards 5.5.1.3, 5.5.1.4, 5.6.3, 5.6.4.

References

[1] CDC (2015) 'Bartonella infection (Cat Scratch Disease, Trench Fever, and Carrion's Disease) *For Health Care Providers*' Available at: https://www.cdc.gov/bartonella/clinicians/index.html [Accessed: 22/12/2017].

[2] CDC (2015) 'Bartonella infection (Cat Scratch Disease, Trench Fever, and Carrion's Disease) *Symptoms*' Available at: https://www.cdc.gov/bartonella/symptoms/index.html [Accessed: 22/12/2017].

[3] Greub G. and Raoult D. (2002) '*Bartonella*: new explanations for old diseases' *Journal of Medical Microbiology* **51** pp.915-923.