



***Brucella* genus**

Brucella is a genus of Gram-negative flagellated coccobacilli and the causative agent of the most common bacterial zoonosis worldwide - brucellosis. It is zoonotically transmitted from contaminated food, contact with infected animals or through inhalation. Although extremely rare, transmission from human-to-human via sexual intercourse or from mother-to-child is possible. People working with animals are most at risk, followed by those working in laboratories, thus it is considered an occupational/laboratory-acquired disease. Many species have been found in various mammals, with *B. melitensis* being the most pathogenic in humans, followed by *B. suis* and the mildest being *B. abortus*. The disease can cause varying symptoms from mild fever to severe or fatal complications of the cardiac system, nervous system and musculoskeletal system.

In the UK and other developed countries, brucellosis is now rare, as many farm animals are vaccinated, infected herds are slaughtered and milk undergoes pasteurisation processes. Globally, the disease is still a major burden, particularly in parts of the Middle East, Asia, South and Central America, Africa, Eastern Europe and countries by the Mediterranean.

Isolation of *Brucella sp.* is commonly done by blood culturing. However, this technique may require prolonged incubation due to the slow-growing nature of this organism. Additionally, isolation of *Brucella* is resource-intensive; it requires level 3 biocontainment facilities and highly skilled technical personnel to handle samples and live bacteria for identification and biotyping. Handling live *Brucella* involves risk of laboratory infection and very strict biosafety rules must be followed (Yu and Nielsen, 2010). On Gram stain, *Brucella* appears as dense clumps of Gram-negative coccobacilli and are exceedingly difficult to visualise. Detection by PCR therefore offers a practical and rapid solution to these diagnostic measures.

Our assay:

At Micropathology we use a UKAS accredited assay utilising end-point PCR with visualisation on ethidium bromide agarose gel for the qualitative detection of *Brucella spp.* *Brucella* species detected by this assay include: *B. abortus*, *B. canis*, *B. melitensis*, *B. neotomae*, *B. ovis* and *B. suis*. UKAS accredited samples for this assay include EDTA/citrated whole blood and CSF. Other sample types may be tested and are reported alongside a caveat to state the assay is not UKAS accredited for testing alternate sample types. Serum and tissue are validated samples but not UKAS

accredited. The minimum sample volume we accept is 200 µL for liquid samples; for tissues, a specimen at least the size of a matchstick head is acceptable for testing.

We DO NOT accept cultures for safety reasons as *Brucella* is a category 3 organism.

Turnaround times are stated in the user manual (<http://www.micropathology.com/customer-downloads-handbooks.php>) with results usually available in practice much sooner than the given time frame. Where there is a delay, we are usually confirming a result and addressing clinical data given with the specimen.

References:

Yu, W. L., & Nielsen, K. (2010). Review of Detection of *Brucella* sp. by Polymerase Chain Reaction. *Croatian Medical Journal*, 51(4), 306–313. <http://doi.org/10.3325/cmj.2010.51.306>