



Molecular diagnosis of Cutibacterium acnes (formerly Propionibacterium)

Cutibacterium spp. (formerly known as *Propionibacterium*) are Gram-positive anaerobic rod-shaped commensals ubiquitous in sweat glands, sebaceous glands, follicles and pores of the skin. It is also found in the conjunctiva, oral cavity, intestinal tract and external ear canal.

In 2016, the genus *Propionibacterium* was reclassified into three new genera, with cutaneous-associated species placed into the new genus *Cutibacterium*. This makes disease-causing *Propionibacterium* species such as *P. acnes*, *P. avidum* and *P. granulosum* now *Cutibacterium*; *C. acnes*, *C. avidum* and *C. granulosum*. This assay can detect *C. acnes*, *C. avidum* and *C. granulosum*.

The most commonly encountered species to cause disease is *C. acnes*. *C. acnes* commonly causes acne when there is excessive production of sebum and the bacterium subsequently becomes trapped in the layers of the skin. Since it is present on the skin, it is an opportunistic pathogen that has the potential to cause a diverse spectrum of diseases including; bone infections, infections associated with implants and skin grafts, endocarditis, and eye infections with risk of meningitis. The majority of invasive *C. acnes* infections involve neurosurgical and orthopaedic infections.

Other clinically relevant but primarily commensal species of *Cutibacterium* include:

- *Cutibacterium avidum*; previously considered of low pathogenicity, but is now recognised as a causative organism of serious spontaneous and surgical site infections for example breast implantation augmentation.
- *Cutibacterium granulosum* is found associated with the sebaceous glands. In conjunction with *C. acnes* it has been shown to contribute to the pathogenesis of acne. However, there have been rare cases where *C. granulosum* has been isolated in patients with endocarditis and septicemia.
- *Cutibacterium namnetense* has in rare cases been associated with infection

Although *Cutibacteria* can be cultured, this often takes several days and may lack sensitivity. Therefore, PCR can be useful in normally sterile sites where culture has been unsuccessful, where organism numbers may be low or where antibiotics have been administered prior to taking the sample.

Since *Cutibacterium* is widely distributed in the human environment it is often challenging to conclude by laboratory methods what is a true infection as compared to contamination. At Micropathology Ltd we use a qualitative PCR assay with the second round performed in real-time. This assay is not UKAS accredited, however the following sample types have been validated: CSF, eye samples and tissue. Turnaround times are stated in the user manual ([https://www.micropathology.com/PDF%20Documents/Laboratory User Handbook.pdf](https://www.micropathology.com/PDF%20Documents/Laboratory%20User%20Handbook.pdf)). Where there is a delay, we are usually confirming a result and addressing clinical data given with the specimen.