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Title: Comparison between classical and molecular (FISH and PCR) methods for Lactobacillus spp. detection in Clinical Samples

Vaginal infection is the main disorder in women of reproductive age worldwide and while not life-threatening, it leads to increased risk of more serious gynecologic infections and pre-term labor. Although this infection varies between countries and it is a mix of various etiologies, the pathogenic infection analysis represents a major challenge for clinical treatment. The key factor is therefore to get a precise diagnosis so clinical treatment selection be the most adequate each vaginal disorder.

During infectious vaginitis, the adhered lactobacilli present in the vaginal epithelium are usually replaced by pathogenic or opportunistic bacteria (Mobiluncus spp., Atopobium vaginae and many others), yeast (such as, Candida albicans) and parasitic protozoan (for example, Trichomonas vaginalis). However, the detection of Lactobacillus spp. imbalance in vaginal microflora due to pathogenic microorganisms in the initiation and progression of infection is vital for clinical treatment.

The detection of lactobacilli based on selective growth culture has improved the sensitivity of classical methods. Many media and incubation conditions for the lactobacilli growth have been tested for optimal recovery from clinical samples. However, numerous comparisons have shown that molecular methods may be a suitable alternative to the classical techniques. However, they are more expensive and the reduced incubation time still remains too long for same-day results. So, molecular techniques can be employed to decrease the time needed for bacteria detection by classical methods with a low detection threshold.

Lactobacilli adhered to vaginal epithelium was detected in situ by molecular methods, more precisely: Polymerase Chain Reaction (PCR) and Peptide Nucleic Acid Fluorescence In Situ Hybridization (PNA-FISH) techniques. In addition, another main goal of this research is the application of PNA-FISH specific for Lactobacilli spp. to study the spatial organization of beneficial lactobacilli strains against a background of pathogenic microorganisms present in clinical samples.

To conclude, we evaluate and validate the efficiency of PNA-FISH and PCR methods against selective growth media for Lactobacillus spp. detection in clinical samples.