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Towards
the veterinary
diagnostics
of the
future

Main topic : Animal Health

LAMP : new DNA amplification technology as a point of care tool to help diagnostic of pathogens allowing a quicker and accurate treatment to the animal

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Introduction

Currently, the direct detection of pathogens contaminating animals can be performed by 1) PCR, giving high sensitive results but this require to send the samples to a specialized laboratory which can give the results only few days later. 2) Antigenic tests which can give a result quickly but with a lower sensibility than PCR.

LAMP technology (Loop mediated isothermal AMPlification) is a NAAT technology (Nucleic Acid Amplification test) which can occur at constant temperature, unlike PCR which need thermal cycles. This allow the use of this technology as a POC (point of care) test and allow the obtention of the result in only 30 min without the necessity to use a thermal cycler. This technology can be really useful to detect highly contagious pathogens causing diseases in animals and the possibility to administrate medicine or isolate the animal immediately.

Methods

Specific LAMP primers for *Theileria equi*, *Babesia caballi*, *Anaplasma phagocytophilum*, were designed and LAMP reactions were performed on the genome of the pathogen and on blood samples extracted by our own specific quick extraction. Performances of these tests were evaluated in our lab and compared to PCR performed in an external lab.

Results

The limit of detection of LAMP tests to detect *Theileria equi*, *Babesia caballi* and *Anaplasma phagocytophilum* of all method (quick extraction and LAMP test) is similar or better of the limit of detection of all method (extraction on column and PCR test) obtained in a conventional analysis laboratory. LAMP test which was designed are really specific for the target (>95% specificity) and are really sensitive for the target (>90% sensibility). This technology is really fast (<30 min) and can be performed near a sick animal. In this case, it can help a veterinarian to determine if the use of imidocarbe or antibiotic could be useful to treat the animal.

Discussion & Conclusion

LAMP tests are a new generation of DNA/RNA amplification test, really specific, really sensitive which can be performed near a sick animal and can give a result in only 30 min. These parameters allow the consideration to use this technology to analyse quickly potential pathogens holder and treat or isolate the animal immediately.