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Towards  
the veterinary  
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future

Main topic : Animal Health

## LAMP : new DNA amplification technology as a point of care tool to help diagnostic of pathogens in animals

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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. In case of a pandemic, this technology can be useful to isolate quickly contaminated animals and avoid a propagation of the pathogen.

### **Methods**

LAMP Primers and LAMP mastermix were chosen for their capabilities to amplify nucleic acids for pathogens infecting animals. Quick nucleic acid extraction and purification from complex samples (blood, urine, feces, nasopharyngeal swabs, ...) were developed to be compatible with LAMP reactions without loss of performances and easy to use. LAMP reader was chosen to be efficient and portative.

### **Results**

LAMP tests, containing 6 LAMP primers allowing a really good specificity (instead of 2 for PCR), strand displacement polymerase and quick nucleic acid extraction (compatible with LAMP technology - performances of the strand displacement polymerase are not affected by PCR inhibitors), were developed to diagnostic pathogens infecting horses, dogs and cats. LAMP, as part of NAAT technology, has performances similar or better than conventional PCR performed in a laboratory. Kits were developed to have a portative format and to be used by a non-specialized technician really quickly (less than 30 min between the sampling and the final result).

Results will explain the differences between PCR and LAMP. Development of a LAMP test will be detailed and results obtained during the development of a LAMP test will be showed. Explanations about how to transfer results obtained at the bench to a kit which can be used near a sick animal will be presented.

### **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.