



AGRITECH &amp; FOODTECH

HEALTH &amp; BIOMEDICAL

# Biosensor for the determination of pathogens in a sample

CONTAMINANT ANALYTICS | LABORATORY SOLUTIONS -  
DEVICES

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## RESEARCH TEAM | INVENTORS

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A silica nanoparticle enhanced dot blot DNA biosensor has developed for the highly sensitive detection of *Campylobacter* spp. in chicken meat. No need for a PCR step as the biotinylated silica-nanoparticles boosted on average a 30fold chemiluminescent read-out. This technology leads the way to the development of point-of-care screening that can be adapted to the detection of any food-born pathogen.

## Technical features

This technology lies within field of diagnostic tests used for detecting pathogenic bacteria in both live and dead chickens either on-site or in a laboratory. Cost-effective, functionalized biotin silica nanoparticles (SiNP) are coupled to a paper based DNA blot test to improve sensitivity of *Campylobacter* nucleic acid detection. Equally applicable to DNA extracted using existing methods and insensitive to DNA polymerase inhibitors, this test is functional in various food matrices. Not only does the probe enable a higher sensitivity of detection, the amount detected can also be quantified. This test drastically cuts time (it takes only 24h) and increases precision which could better detect this bacterial strain or be adapted to other biological contaminants.

## Possible applications

- The biosensor is applicable to several analytes and to development of:
  - Reagents kit for using in lab;
  - Lab in a box with inside all necessary equipment;
  - Lab-on-chip for a rapid and portable test with smartphone application for results; this is a long-term solution and require collaboration efforts.

## Advantages

- Up to 300 times more sensitive than dot Blot on the market thanks to a single additional step:
  - Detection levels of 3pg/μL of DNA(600 bacterial cells);
  - Drastic reduction in time when compared with ISO-certified methods (from 7 to 1 day);
  - Competitive costs and easy to integrate into existing kits.

## PATENT OWNERS



Centre national de la recherche scientifique (CNRS)  
Institut national de recherche pour l'agriculture l'alimentation et l'environnement

