

Rapid Diagnostics in Health Care and Agriculture

*C. Lyng Halvorsen¹, J. Bang Jensen¹, M. Laage Kragh¹,
M. Vikkelsø Pedersen² and A. Vasie¹*

¹DTU Systems Biology, Technical University of Denmark

²DTU Mechanical Engineering, Technical University of Denmark

PROBLEMS WITH ANTIBIOTIC RESISTANCE IN BACTERIAL INFECTIONS

Excessive use of antibiotics are responsible for the rise of antibiotic resistance in bacteria. When these bacteria cause infections, treatment options are very limited and this creates a major issue in the general health care. One of the problems, giving rise to resistance is the tendency of medical doctors and veterinarians to administer antibiotics without the use of precise diagnostic tools. The resulting treatment with broad-spectrum antibiotics is causing resistance and has given rise to multi-drug resistant bacteria, now spreading at hospitals and beyond. Lowering non-specific antibiotic treatment and thereby resistance, will create a more sustainable future in treatment of bacteria infections.

QPCR LAB-IN-A-CHIP AS A RAPID DIAGNOSTIC TOOL

The use of rapid diagnostic tools is one way to lower incorrect use of broad-spectrum antibiotics. If rapid diagnostic tools are used, specific antibiotics that target the bacteria causing the infection can be used, thus lowering the risk of antibiotic resistance evolving. We use known qPCR and lab-on-a-chip technology in a new way, to implement a simple assay that can rapidly identify multiple bacteria at your local medical practitioner and thus ensuring correct treatment.

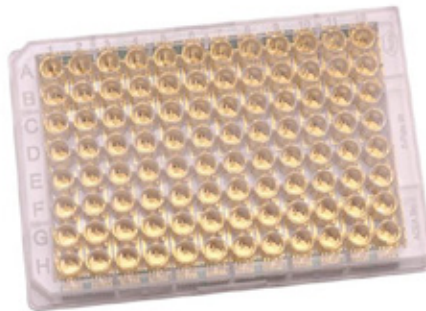


Figure 1. qPCR lab-on-a-chip

IMPACT

- Correct treatment of infectious diseases
- Quicker detection of potential epidemics
- Lowering of broad-spectrum antibiotic treatment, and thus lowering of antibiotic resistance in bacteria
- Securing the possibility to treat infectious diseases with antibiotics in the future, and thus ensuring a sustainable health care