

Rapid detection of antimicrobial resistance in blood by loop mediated isothermal amplification (LAMP)

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Blood-stream infections and sepsis are among the most acute and severe conditions encountered in clinical medicine, requiring immediate targeted therapy. Current state of the art in sepsis diagnostics is blood culture, which takes 1-4 days to come out positive and provide information on bacterial identity and antimicrobial susceptibility pattern. The long timespan and low sensitivity of blood culture are major challenges, in particular when antibiotics have been administered before blood cultures have been collected. In the current project we will establish rapid microbiological diagnostic tests for the detection of common sepsis pathogens and genes encoding antimicrobial resistance (AMR) in blood. We will apply loop mediated isothermal amplification tests (LAMP) to target the two most common sepsis pathogens in Norway, *Escherichia coli* and *Staphylococcus aureus*. Furthermore, we will develop LAMP tests for the detection of CTX-M genes which encode extended-spectrum β -lactamases (ESBL) in *Enterobacteriaceae*, and the *mecA* gene which accounts for the overwhelming majority of methicillin resistance in *S. aureus* (MRSA). Tests will be optimised for use in human whole blood, and for each test the limit-of-detection will be determined.