Sepsis is the body’s dysregulated and life-threatening response to an infection. The infectious pathogen in sepsis is often spread into the bloodstream, causing a bloodstream infection. Today, blood culture is the standard diagnostic method to detect a bloodstream infection. However, blood culture has several limitations, such as a long time to result and suboptimal sensitivity. With better methods for rapid detection of the causative pathogen, more sepsis patients would get early, appropriate antimicrobials. This would have beneficial consequences, not only in terms of patient survival, but also for the global problem of antibiotic resistance. By molecular methods, such as PCR, pathogen DNA can be detected within hours. In addition, PCR enables quantification of the DNA, which might be useful in sepsis management for indication of infection severity and treatment response.

This thesis aims to increase the knowledge on how quantitative PCR can be used in the diagnostics of bloodstream infections. In the studies presented in the thesis, different PCR methods were used, both commercial and in-house assays, for analyses of blood samples from patients at the Emergency Department. We found that high amounts of bacterial DNA in the bloodstream were associated with inflammation, presence of sepsis, and mortality, while low amounts of bacterial DNA often were due to contamination bacteria.