

# Rapid and specific detection of pathogenic bacteria using recombinant receptor binding proteins of bacteriophages

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For infections caused by highly pathogenic bacteria, such as *Bacillus anthracis* or *Yersinia pestis*, timely antibiotic therapy for infected patients is paramount. To ensure the correct treatment regimen, rapid and unambiguous pathogen detection is essential. While polymerase chain reaction (PCR) is the gold standard for diagnostics of most infectious diseases, antibody-based assays that detect specific antigens of the pathogen are commonly used for rapid point of care (POC) testing or as confirmatory methods in diagnostic laboratories. Nevertheless, antibodies often feature insufficient specificity due to the high degree of relatedness of these pathogens to their non- or less pathogenic relatives. Receptor binding proteins (RBPs) of bacteriophages, which mediate recognition and binding to host bacteria, represent a promising alternative to antibodies. Here, we identified RBPs derived from various phages targeting *Bacillus anthracis* and *Yersinia pestis*. These RBPs were engineered into bio-probes and recombinantly expressed, incorporating fluorescent proteins or enzymes to enable specific detection of the target pathogens. Additionally, the RBPs were coupled to magnetic beads to serve as highly specific capture molecules for the enrichment and isolation of bacterial pathogens from different matrices.

We are currently expanding our library of RBP bio-probes to specifically target other pathogens of interest, including *Burkholderia spp.*, *Klebsiella pneumoniae*, and *Mycobacterium tuberculosis*. We also offer an RBP Starter Kit containing several engineered bio-probes for the detection of *E. coli* (contact Leonie or Peter for more details).