



# CRITICAL REAGENTS PROGRAM FACT SHEET

Certified ISO 9001 Organization

## ABOUT THE CRP

As a national resource for the biological defense community, the CRP serves as the principal resource of high quality, validated, and standardized biological reference materials, reagents, and assays that meet the technology-development and sustainment needs of the Department of Defense and its partners. The CRP also supports the biological defense community's mission by facilitating the transition of new technologies and coordinating their advanced development, efficient production and timely distribution.

The CRP product portfolio includes antibodies, inactivated antigens, genomic materials, Electrochemiluminescence (ECL) assays, Polymerase Chain Reaction (PCR) assays, Lateral Flow Immunoassays (LFIs), and Biological Sampling Kits.

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### Website & Catalog:

<http://www.jpeocbd.osd.mil/packs/default.aspx?pg=1205>

## COMMODITY MANAGER

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# Polymerase-Chain Reaction (PCR) Assay

## Description

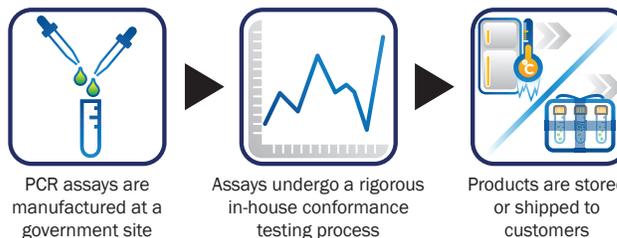
All living organisms encode their genetic repertoire in the form of DNA, and in the case of some viruses, as RNA. The genomes of all the living organisms lead to the various phenotypic characteristics that distinguish individuals. The differences in the genetic make-up of microbes can be used to classify/differentiate them at the genus, species, and strain level using molecular techniques such as Polymerase Chain Reaction (PCR). In PCR, specific genetic sequences are amplified using unique signature sequences to detect the presence of the organism in a given sample. Many different variations of the PCR can be designed for rapid detection of pathogenic bacteria and viruses.

CRP PCR assays are uniquely formulated for a specific biological threat agent. Using a pair of DNA primers that recognize and flank the genetic sequence of interest, the PCR assay synthesizes an exact copy of the organism's DNA between the primers. The primers are designed to maximize the sensitivity to the specific organism of interest while eliminating cross-reactivity with related organisms. Multiple, continuous cycles of DNA primer binding followed by DNA synthesis leads to the exponential amplification of an exact copy of the specific DNA. For quantitative PCR applications, the exponential amplification of DNA is coupled to a DNA probe that yields a signal during each amplification cycle, allowing for quantitative analysis of the DNA in "real-time".

## Production

CRP PCR assays are produced under ISO Guide 34 and ISO/IEC 17025 Quality Management Systems. A schematic of the process is detailed below.

### PCR Production



## Technology Applications

CRP PCR assays are used in biological warfare agent (BWA) surveillance and detection as well as to confirm positive results for other detection methods (i.e. an orthogonal approach). These assays can also be used to assess viral or bacterial infection levels of test subjects in animal model studies.

## Catalog Offerings

The CRP Catalog contains a detailed list of real-time quantitative PCR assays specific for biological threat agents and simulants that are compatible with several PCR platforms in use by the DoD and other Government agencies. To place orders online, please visit OSCAR – the Ordering System CRP Assays and Reagents – at <https://pki.jacks.jpeocbd.army.mil/crp/default.aspx>. For more information on how to register for a user account and view OSCAR tutorials, please visit the CRP's website at: <http://www.jpeocbd.osd.mil/packs/Default.aspx?pg=1205>.