OPTIMIZED ANALYSIS OF COMBINED CODIS AND EUROPEAN MARKER PROFILES USING INTERNAL QUALITY SENSORS WITH QIAGENs INVESTIGATOR 24PLEX QS KIT

D. Müller, M. Breitbach, S. Cornelius, S. Pakulla-Dickel, M. König, A. Prochnow, L. Bochmann, M. Scherer, R. Peist, QIAGEN GmbH

Forensic analysts are often faced with difficult STR results and the questions thereupon. What is the reason that no peaks are visible in the electropherogram? Did the PCR fail? Was the DNA concentration too low? The kits of the Investigator 24plex family contain a novel Quality Sensor System that is useful for evaluating the amplification efficiency of the PCR. It indicates if the reaction has worked in general and furthermore allows discriminating between the presence of inhibitors or DNA degradation as a cause for the typical ski slope effect observed in STR profiles of such challenging samples. This information can be used to choose the most appropriate rework strategy.

There will be two 24plex kit formats available: One kit is designed for purified DNA from casework and reference samples, the other one is optimized for direct amplification of reference samples, like blood or buccal cells on FTA or swabs. Both kits contain the novel Quality Sensor System and the same primers. They are co-amplifying 23 markers according to the recommendations of the CODIS Core Loci Working Group. To expand the CODIS core loci set in the United States, the working group recommended a combination of polymorphic STR markers of the Combined DNA Index System (CODIS), the European Network of Forensic Science Institutes (ENFSI), and the European DNA Profiling Group (EDNAP). The 24plex assays use a new 6-dye technology in order to keep the amplicon length of the 23 markers short while at the same time avoid overlapping of markers. The assay is based on a new PCR chemistry that ensures robust and fast PCR amplification with improved inhibitor resistance and easy handling.