ENHANCED RETURN OF INTERPRETABLE RESULTS FROM CHALLENGING SAMPLES WITH THE GLOBALFILER™ KIT

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Multiplex STR genotyping is the current gold-standard method in human identification throughout the world. Recently, the CODIS Core Loci Working Group made a recommendation to expand the U.S. CODIS Core Loci from 13 to 20 “required” loci and 3 “highly recommended” loci, thus solidifying the need for a highly discriminating global STR multiplex system. Development of such a system, capable of delivering this level of information without sacrificing performance or reliability, however, presented a number of challenges.

The GlobalFiler™ system, with a kit specifically developed for casework type samples, was designed to meet these demands and facilitate improved interpretation of challenging sample profiles routinely encountered in forensic casework, including those returned from inhibited, degraded, and mixture samples. We describe here design strategies employed to achieve this goal, including use of an additional fluorescent dye channel to maximize the number of smaller STR products and miniSTRs captured, as well as formulation enhancements providing for increased sensitivity and inhibitor tolerance, clean baselines and high color balances while minimizing stutter peak heights, artifacts, and cross-reactivity with non-human species for ease of complex profile interpretation. Also incorporated in this kit are three gender markers in a single dye channel, facilitating robust male:female ratio determination and mixture interpretation.

Data from studies conducted internally and by external test site laboratories demonstrating increased recovery of alleles from a variety of challenging evidence sample types compared to previously utilized methods are also presented.