



B29 Development, Validation and Application of a High Throughput System for Detection of Human Male DNA in Screening for Rape Kits

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After attending this presentation, attendees will be provided information regarding a novel screening system for detection of human male DNA in forensic samples.

This presentation will impact the forensic community and/or humanity by demonstrating a novel screening approach that fills the gap between current technologies for detection of human male DNA. Current screening methods are targeted to detect seminal fluid proteins or sperm cells and, therefore, provided false positive and negative results when the samples were processed for STR analysis.

Screening of sexual assault evidence samples for the presence of sperm or semen is generally the first step in forensic DNA analysis. Y-Detect is a novel screening system for the detection of male DNA in all types of forensic samples. The method is based on PCR amplification of an *Alu* insertion fixed within the Y chromosome. The *Alu* family of interspersed repeats is the most successful of the mobile genetic elements within primate genomes, having amplified to a copy number of greater than 1,000,000 per haploid genome. *Alu* repeats are unique nuclear markers that are ideally suited for human identity testing. Individual *Alu* repeats are approximately 300 bp in length and are thought to be derived from the 7SL RNA gene. Y-Detect is a two-plex PCR system that achieves amplification of human male and Avian DNA. Simultaneous amplification of Avian DNA enables monitoring for the presence of possible PCR inhibitors in each tube. The primers for human and Avian DNA are labeled with FAM and JOE generating fragments of 156 and 202 bp, respectively, that are separated on 310 or 3100 Genetic Analyzers. The developmental validation studies were performed according to the DNA Advisory Board's (DAB) Quality Assurance Standards. Unlike currently used methods such as seminal protein p30, acid phosphatase and microscopic examination for presence of sperm, the Y-Detect system enables screening of all types of evidence biological samples. Further, individual assays can be performed using a 96 well format to facilitate high-throughput screening. The Y-Detect assay is a sensitive, valid and robust multiplex system for the screening of biological samples for the presence of human male DNA.

Over 100 rape kits were screened using the Y-Detect system and p30. Findings from this study will be presented.

Screening, Y-Detect, Forensic Casework