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SCREENING OF FORENSIC EVIDENCE SAMPLES TO DETECT THE PRESENCE OF HUMAN MALE DNA USING A NOVEL, HIGH THROUGHPUT, REAL-TIME PCR-BASED DETECTION SYSTEM: Y-DETECT™ RT

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Learning Objective: This presentation introduces to the forensic community the development of a novel, Real-Time PCR-based genetic system for the screening of forensic evidence samples for the presence of male DNA.

Screening of sexual assault evidence samples for the presence of sperm or semen is commonly the first step in the long process of forensic investigation. Reliagene Technologies, Inc. has developed a Real-Time PCR-based, single-step genetic system, Y-Detect RT™, for the screening of forensic evidence samples for the presence of male DNA in a variety of biological samples. Y-Detect RT™ incorporates the ability to not only detect but also extract and estimate the quantity of male chromosomal DNA by utilizing two novel Invitrogen technologies: Charge-Switch® DNA extraction and D-LUX™ fluorescently labeled primers. D-LUX™ primers offer high sensitivity, the ability to perform melting curve analysis in order to distinguish genuine amplicons from primer-dimer and other artifacts, the ability to quantitate on any real-time machine and the ability to perform a duplex reaction that contains the Y-chromosome specific target with a PCR amp positive. Y-Detect RT™ methodology is based on detection of a human-specific *Alu* insertion that is present on the Y chromosome. The *Alu* family of interspersed repeats have a number of advantages as human identity tools that set them apart from STRs. Unlike currently used methods such as microscopic examination for the presence of sperm, the Y-Detect™ RT system enables screening of all types of biological samples on a rapid and sample conservative basis. Further, individual assays can be performed on as little as 10% of the evidence sample and adapted to a 96 well format to facilitate high-throughput screening.

Key Words: Forensic screening, Y-Detect; human male DNA.