B97 Mathematical Model of the Real Time PCR Amplification Process Used to Quantify DNA for Forensic Science Applications, Applied Research, Training, and Service at the Biotechnology Center, Shadow Lane Campus, University of Nevada Las Vegas

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After attending this presentation, attendees will have increased understanding of the application of mathematical modeling to the Real Time PCR process used to quantify DNA for the ultimate purpose of human identification. The kinetics of the process will be explained as will the role of inhibitors and reactant supply. The programming and use of reagents during amplification will be explored to learn ways in which the analysis can be improved, for example in dealing with a variety of inhibitors.

This presentation will impact the forensic community and/or humanity by establishing a specialized short term niche training, laboratory service, and applied research in Forensic DNA Profiling. Many of the workshops and services are designed to satisfy specific individual needs of those in the forensic community. From this presentation, attendees will have an increased understanding of both mathematical modeling and also further insight into Real Time PCR and its use. This training is valuable in helping those in the forensic community improve their skills, advance in the profession, or attain a professional position in the forensic community.

In a process that started early in this decade, a new Biotechnology Center has been established at the Shadow Lane Campus of the University of Nevada Las Vegas. Within this Center, a modern Forensic DNA Laboratory is in place that is providing training, laboratory services, applied research, and assisting entrepreneurs in DNA Profiling.

This presentation will cover the derivation and testing of the mathematical model of Real Time PCR for quantitation of DNA. The model will be tested against different patterns in supply of reactants and the presence of different inhibitors encountered in practice. The interplay between inhibitors, reactants, enzyme availability, and kinetics will be used to point out actual effects potentially observed in isolation and amplification of DNA. Recommendations will be provided for use of this information to improve forensic DNA profiling. Suggestions for improving the quantitation assay will be presented.

Mathematical Model, Quantitation of DNA, Real Time PCR

 ** Presenting Author*