

## **Trials and Tribulations in the Validation and Implementation of Probabilistic Genotyping**

The adoption of probabilistic genotyping (PG) by forensic DNA laboratories in the United States and internationally has increased rapidly over the past four years. While PG software is an incredibly powerful tool in DNA analysis, validating and implementing probabilistic genotyping for DNA statistical analyses is not only technically challenging but can also present a multitude of operational and educational challenges. Available personnel, caseloads, funding, adequate training, and IT limitations can significantly impact the efficiency of a laboratory's adoption of the technology. In addition, educating agency administration, law enforcement partners, and legal partners can prove time-consuming and difficult. The Michigan State Police finalized implementation of the probabilistic genotyping software STRmix® in DNA casework in February of 2016. Throughout that process, the MSP learned a number of valuable lessons in enduring and overcoming the technical, operational, and educational challenges probabilistic genotyping presents. A brief historical review of the necessity and development of probabilistic genotyping methods will provide a context for understanding the advantages of moving to such complex analytical software from traditional statistical methods. An overview of the validation and implementation of STRmix® at the Michigan State Police will provide an example of the shift to probabilistic genotyping in large, multi-lab state system with limited resources. Key elements in the development of an efficient and successful validation and implementation plan will be identified and described. Lastly, a discussion of the lessons learned during the Michigan State Police STRmix® validation and implementation will offer an opportunity for other laboratories to avoid unnecessary delays and create awareness of the potential difficulties they might encounter. Special consideration will be made to the preparation of analytical staff members, education of partners, structuring and content of reports, the revision of policies after gaining experience, and seeking admissibility in courts at both the State and Federal levels.