



E63 Validation! Validation! Validation!...With a Touch of Reality

Daniele S. Podini, PhD, Department of Forensic Science, 2100 Foxhall Road, NW, Washington, DC 20007*

After attending this presentation, attendees will be informed concerning a project-based learning approach to teach the conceptual and practical aspect of internal validation studies. This presentation will also discuss how “true-mock” cases can have an emotional impact on students and make them understand and appreciate how their jobs as forensic scientists will impact not only society but also single individuals.

This presentation will impact the forensic science community by having better prepared and committed individuals entering the workforce.

As the Combined DNA Index System (CODIS) core loci are about to increase from 13 to 20, forensic DNA laboratories are all tasked with internally validating new Short Tandem Repeat (STR) kits that incorporate the added markers. Validation is extremely time consuming, significantly impacting laboratories’ resources. Furthermore, as the sensitivity of STR kits increases together with the increase of mixed-touch DNA samples submitted to forensic laboratories, developing comprehensive validation studies, from which is possible to derive sound interpretation procedures, is becoming more and more important. To address this need, the Forensic Molecular Biology III class at George Washington University (GWU) focuses on validation. Students are tasked with the “internal validation” of a commercially available STR kit. In Fall 2014, the class validated a 5 μ L amplification of the AmpflSTR® Identifier® Plus kit, whereas in Fall 2015, the class will develop the internal validation of PowerPlex® 16HS. Starting from the review of the literature and through class discussions guided by the instructor, students design the validation study, then perform it in the laboratory. Each student then independently produces a validation manual describing in detail how he/she determined the analytical threshold, the stochastic threshold, the heterozygote peak balance threshold, mixture ratio, etc.

Understanding validation studies is essential for a DNA analyst to properly interpret data — it is what supports the conclusions that are drawn from the analytical process. Giving the students the opportunity to focus on this important issue and to understand the process and its challenges has proven extremely beneficial for their overall preparation for the job market.

An important component of the Forensic Molecular Biology II class at GWU is the mock case. Students are given properly sealed evidence, which they have to receive, maintaining chain of custody, process, turn it in properly re-sealed, and produce a certificate of analysis/report. Students are also tasked with presenting the case and their findings to the rest of the department (students and faculty) during a graduate seminar session. In the past two years, the students did not know that the evidence mimicked that of a real case. The victim survived and the perpetrators were apprehended and brought to justice, also thanks to DNA analysis. At the end of the presentation, students were told that the facts they described had actually happened and were introduced to the survivor who was present in the audience. The survivor then gave a talk describing how important it was for her recovery to see the perpetrator/s apprehended and then convicted, and how important the job of the DNA analyst (and forensic scientists in general) is to people like her. It has been a very emotional experience for the students.

The reasoning that inspired this approach is that it is often easier to remember an emotion, how something made us feel, rather than a fact. It is a fact that the job of the forensic scientist has an immediate impact on society: closure for a victim, excluding an innocent suspect, or identifying a criminal that would hurt others if not apprehended. The emotional experience of that day will help students always remember that fact

Validation, Inspire, Education