DNA Expert Testimony
Practical Considerations

Five possible scenarios for the presentation of DNA expert testimony:

(1) Known standards and unknown samples are analyzed by one expert who testifies at trial
(2) Known standards and unknown samples are analyzed by two different experts who both testify at trial
(3) Known standards are analyzed by expert who testifies and unknowns are analyzed by expert who does not testify; testifying expert provides opinion based on the other expert's data/results
(4) Known standards are analyzed by expert who does not testify and unknowns are analyzed by expert who does testify at trial; testifying expert provides opinion based on the other expert's data/results
(5) Known standards and unknown samples are analyzed by person/s who do not testify; expert who performs an independent analysis based on the other expert/s' data/results testifies at trial

Under Department of Youth Servs. v. A Juvenile, 398 Mass. 516 (1986), scenarios (1) and (2) above are straightforward. In scenario (1) the witness testifies based on "facts observed by the expert or within the expert's own knowledge." In scenario (2) the witness testifies based on both "facts observed by the expert or within the expert's knowledge" and "by the testimony of other witnesses already given or to be given at trial."

Scenarios (3), (4) and (5) above each implicate the *Crawford* prohibitions against testimonial hearsay, Crawford v. Washington, 541 U.S. 36 (2004), and have led to challenges to expert testimony based upon "facts or data not in evidence if the facts or data are independently admissible."

Scenario (3)
This is the fact scenario in Williams v. Illinois, 567 U.S. --- ; 132 S. Ct. 2221 (2012). There the known standards were analyzed by a DNA analyst at the state lab who testified at trial and evidence samples (unknowns) were analyzed by a Cellmark analyst who did not testify. State analyst based their opinion on Cellmark expert's data/results. This was a situation where the evidence samples were sent to Cellmark lab before a suspect was identified and a DNA profile was obtained. The state analyst compared the known profile to the "Cellmark profile." Admissibility turned on fact that it was a bench trial and not a jury trial under Illinois law. Additionally, the plurality reasoned the Cellmark profile was not introduced for the truth of the matter, but merely as a basis of the expert's opinion, which is admissible on direct under Illinois law, unlike Massachusetts.

Scenario (4)
This is the scenario in Commonwealth v. Banville, 457 Mass. 530 (2010) and Commonwealth v. McCowen, 458 Mass. 461, 482-484 (2010)

Banville – testing done at MSP lab; evidence sample analyzed by expert witness who testified, known standard analyzed by another analyst at the same lab who did not; no details about the profiles themselves were offered on direct. Expert testified to opinions including or excluding the defendant or the victim as a contributor. In conducting 33E review, the Court stated the form of the opinion – "a match" or "not a match" – presented was inadmissible testimonial hearsay and thus violated the defendant's 6th Amendment confrontation rights; where witness properly testified to the random match probability calculation using PopStats there was no need to testify about "a match." However, there was no substantial risk of a miscarriage of justice (because it was not objected to) and, even if preserved, the error would have been harmless. 457 Mass. at 541 - 542 & n. 3.

The scope of such an expert's direct testimony in scenario (4) is limited to the witness' own actions and observations; the identification of the hearsay material on which the witness relied; the reliance of professionals within the filed on such hearsay; and her own opinion

Form of opinion should be stated: "Based on your education, training and experience, your development of a DNA profile from a particular evidence item, and your review of the DNA profile of the defendant/victim developed by non-testifying expert, what is the probability that the DNA in question belonged to someone other than the defendant/victim?"

McCowen – same scenario as in Banville
Permissible form of opinion: Based on your education, training and experience, your development of a DNA profile from a particular evidence item, and your review of the DNA profile of the defendant/victim developed by non-testifying expert, do you have an opinion whether the defendant/victim was a potential contributor of the DNA profile in each unknown sample and the statistical likelihood that an individual in various population groups could have been a contributor of that DNA was proper 458 Mass. at 483.

Admission of chart with hearsay results of non-testifying expert was testimonial hearsay and should not have been admitted absent stipulation or agreement by the parties; however, there was no substantial risk of a miscarriage of justice, because the random match probability significance was the probative testimony, not the inadmissible allele numbers derived from the non-testifying analyst's results. Id. at 483-484.

Scenario (5)
Commonwealth v. Tassone, 468 Mass. 391, 401 (2014) – Known standard was examined at state lab but analyst who generated the profile did not testify; unknown sample examined at Cellmark but analyst who generated the profile did not testify. Another state DNA analyst testified to her independent review of the DNA profile generated by Cellmark from the evidence swab and the known DNA profile of the defendant generated by the other non-testifying state analyst and concluded the defendant's profile matched the profile from the evidence swab. "If the Commonwealth sends the crime scene DNA to Cellmark for analysis and seeks to offer in evidence the opinion the crime scene DNA

matches the defendant's DNA it will need at a minimum to call an expert witness from Cellmark." Id. at 402. Otherwise, the defense is deprived of a meaningful opportunity to cross-examine regarding the laboratory work, procedures or protocols performed by the other lab as well as the reliability of the other lab's data on which the testifying expert's opinion rests. Note, although the SJC characterizes this evidence by using "match" language, it expressly disapproved the use of "match" language in *Banville*, herein-above, where only one of the two profiles was obtained by the witness. Suffice it to say it is advisable to avoid "match" language, unless both profiles are admitted by testimony of the DNA expert whose analysis resulted in each profile being generated or by stipulation of the parties.

Contrast Commonwealth v. Greineder, (*Greineder II*), 464 Mass. 580, 592 (2013). In *Greineder*, a DNA expert testified on direct about details of DNA test results obtained by analysts who did not testify. Although the details of the results should not have been admitted on direct, the defendant was not prejudiced by the erroneous admission in the circumstances of the case and, in any event, the ultimate opinion was properly admitted. In *Greineder II*, the SJC distinguished *Williams* by noting that "*Williams* focused on the admissibility of the basis of the expert's independent opinion", [i.e., the details of the results of the non-testifying expert], "and not the admissibility of the expert opinion itself." The SJC held that Massachusetts' evidentiary rules for admissibility set forth in Department of Youth Servs. v. A Juvenile, 398 Mass. 516 (1986) afford a defendant more protection than the Sixth Amendment. In *Greneider,* the expert witness was an expert in biology and DNA who was the director of the private laboratory, Cellmark, where the tests were performed and was a person who could be meaningfully cross-examined about the reliability of the underlying data and the procedures and protocols of the laboratory.

See also Commonwealth v. Chappell, 473 Mass. 191 (2015), where a state lab DNA expert was permitted to testify based on the results of DNA testing performed by another analyst who was no longer employed by the state crime lab at the time of the trial and not available to testify. The substitute expert called to testify was the section manager for forensic biology at the lab including the DNA unit and was responsible for supervising 25 – 30 DNA analysts. On direct examination the witness described the process by which the crime lab conducts DNA analysis including the specific protocols used.

In determining whether such testimony is admissible, the critical issue with respect to an expert, including, in particular, a DNA analyst, is whether the defendant is able to cross-examine the expert in a meaningful way regarding the possible flaws relating to the underlying data that forms the basis of his or her opinion. In *Chappell*, the defendant was able to cross-examine the witness meaningfully about the reliability of the underlying DNA testing procedures and data, given that the witness was the section manager for forensic biology, supervisor of the DNA analysts and was directly involved in the case as the second reader and technical reviewer; in those capacities she had reviewed both the raw DNA data produced by the crime lab's analytic instruments and the DNA samples themselves. The witness described the analytical process that the unavailable witness as an analyst in the crime lab would have followed and the witness' own opinions that she

had formed independently and directly from the case review and analysis she herself performed. Her testimony was admissible in all respects.

See also Commonwealth v. Bins, 465 Mass. 348 (2013) (as in *Tassone*, the SJC in providing the facts referred to the DNA testimony using "match" language, although the expert witness had no personal knowledge of the known results; nevertheless, under 33E review use of charts depicting both profiles did not result in a substantial risk of a miscarriage of justice.)

See also Commonwealth v. Barbosa, 457 Mass. 773 (2010) (supervisor of unavailable Boston Police Crime Laboratory analyst testified)
Scope of testimony on direct:

- Witness own education training and experience in forensic DNA testing
- What a DNA profile is and its value in a forensic setting
- Explanation of the difference between known and unknowns
- How a comparative analysis takes place and what possible conclusions can be drawn from that analysis
- How DNA testing is conducted, i.e., the four step process
- Opinion whether a defendant or a victim is a possible source of the DNA
- Statistical significance

Although the court recognized that jurors may infer that the DNA profile of the defendant or the victim matched exactly the profile from the crime scene the risk that a juror may infer facts not in evidence from an opinion is not a reason to declare it inadmissible unless unfair prejudice arising from the facts inferred substantially outweighs the probative value of the opinion. The SJC concluded that the balance weighs heavily in favor of the admission of the opinion and the objective nature of the science underlying DNA analysis strengthens the opinion's probative weight and diminishes the risk of unfair prejudice

If there is reason to believe that the evidence has been mishandled or mislabeled or the data fabricated or manipulated, counsel should consider filing a pre-trial *Daubert-Lanigan* motion to exclude the evidence, because an opinion must rest on evidence or data that provide a permissible basis for an expert to form an opinion.

The SJC observed that the defense usually benefits from the absence of the analyst in that they can undermine the expert's testimony by showing that the witness could not be sure that there were no flaws in the analyst's work, without establishing that there were any actual flaws.

Barbosa described a number of cross-examination topics:

- Error rates in forensic testing introduced via carelessness, incompetence or fraud (e.g., risk wrong sample tested, risk of mislabeling or transcription error, level of training of analyst, quality of instrumentation used)
- Specific data relied on, basis on which the witness concluded the data relied on was adequate or appropriate

- Witness' basis for concluding that the data had been prepared in conformity with relevant accepted professional standards

Additional Admissibility Issues

(1) DNA opinion must be supported by expression of the rarity of the profile in various population groups. Confrontation issue raised by use of PopStats by analyst who was not a statistician:

Commonwealth v. Cole, 473 Mass. 317, 329-330 (2015) – addressed the admission of DNA statistical probabilities based on use of the computer program PopStat where DNA analyst who testified did not create the program but rather it had been supplied by the FBI; defendant claimed the probability statistics constituted hearsay and their admission, over his objection, violated his confrontation rights under the 6th and 14th Amendments to the US Constitution and art. 12 of the Declaration of Rights. The statistical significance of the match is a necessary requirement for the admission of DNA test results. The SJC held that the testimony concerning the probability statistics was not testimonial hearsay, i.e. not statements made in a formal or solemnized setting for, or in response to, law enforcement interrogation; "creator of PopStat would not anticipate that the probability statistics would be used to prosecute this particular defendant." Id. at 330.

Relevant question was whether the foundation was sufficient for the introduction of the observed result. Defense claimed that because the witness did not create PopStat and was not familiar with how they were derived the evidence lacked an adequate scientific foundation. To the extent that the defendant wanted to challenge the scientific reliability of the PopStat program, he was required to file the appropriate pre-trial motion. Id. at 328.

In Cole, the defense had the opportunity on cross-examination to expose flaws in the basis of the expert's testimony concerning the statistical significance of the results. Thus admission of probability statistics derived by utilization of PopStat did not violate the defendant's rights. Id.

(2) Foundation concerning what the evidence sample tested is and how it was collected:

In Commonwealth v. Jones, 472 Mass. 707 (2015), the Court held that it was error to permit the criminalist expert who was not present when the victim's rape kit examination was performed and who had no connection to the hospital where the swabs were collected, to testify, based on labeling of the specimens and her understanding of how the three swabs were collected, what each swab was. At trial the SANE nurse who collected the specimens was not called as a witness. The rape kit inventory list (an objected to part of both the hospital records and the rape kit itself) was a series of factual statements concerning how the various swabs were collected and did not cure the defect. Because the purpose of the rape kit is to gather forensic evidence for use in criminal prosecution, this information was plainly testimonial.

The SJC in reaching its decision distinguished *Greineder*, noting *Jones* did "not involve a situation where a testifying analyst reviewed and then built on the findings of a non-testifying analyst in reaching their own opinion. [Citation omitted] The hearsay at issue [in *Jones*] involved the circumstances under which the evidence was collected" from a particular part of a victim's body. Having no personal knowledge of the process by which the swabs were collected, the expert lacked the capacity to do so, thus there was no meaningful opportunity to cross-examine about the nurse's representations concerning the origin of each of the swabs. The testifying expert also lacked the capacity to address chain of custody and evidence handling protocols relevant to the process by which the swabs were collected. Jones, supra at 716.