CASE REPORTS

Another Reason to Quit Smoking

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An 18-year-old African American man was found dead along the roadway in Greenville, Delaware. He had been shot four times. Among the physical evidence found at the crime scene were shell casings from two different weapons and one Newport cigarette butt. The detectives in the case did not have much to go on except the presumption that multiple killers may have been involved and perhaps one of them had smoked a Newport cigarette at the scene. Of course it was just as likely that the cigarette butt was simply litter that had found its way into a crime scene. In fact, the latter seemed more likely.

As the investigation proceeded, two African American suspects were developed. They were known drug dealers to whom the victim apparently owed a $600 drug debt. Coincidentally, they smoked Newports. A request was made to the DNA Unit at the Delaware Office of the Chief Medical Examiner to perform DNA analysis on the cigarette butt and compare it to the DNA of the two suspects. It should be noted that our office had just gone online with STR analysis using the Promega PowerPlex® 16 System[a,c,d] nine days earlier. Not surprisingly, the detectives did not exude confidence when submitting the case. They repeatedly asked questions such as, "So how long have you guys been doing this?" and "Are you sure that your lab can handle this?" However, their reservations soon turned into commendations. The results were hard to believe. Not only did the cigarette butt yield a complete DNA profile, but it yielded two complete DNA profiles. Furthermore, the two complete DNA profiles were consistent with both of the suspects' DNA profiles. The two suspects had most likely shared a cigarette at the crime scene.

This cigarette butt, which seemed likely to be just a piece of litter, was actually the only physical link connecting both men to the murder. As can be seen in Table 1, this was a perfect mixture. Every allele associated with each suspect was present in the mixture. As a result, a report was issued that stated that neither suspect could be excluded as a DNA contributor to the cigarette butt, while 99.99999986% of the African American population could be excluded. In other words, only 1 out of every 718,278,919 African Americans could be included in this mixture and both of the suspects were included.

Table 1. DNA Profiles of the Cigarette Butt Found at the Scene and of the Two Suspects.

Genetic Locus	Cigarette Butt	Suspect #1	Suspect #2
D3S1358	14,15,17,18	14,17	15,18
TH01	7,8,10	7,10	8
D21S11	29,30,30.2,31	29,30.2	30,31
D18S51	13,16,17	16,17	13
Penta E	5,15,16,18	15,18	5,16
D5S818	11,12	12	11,12
D13S317	11,12,13	11,12	12,13
D7S820	10,12,13	10	12,13
D16S539	8,9,11	11	8,9
CSF1PO	7,10,11,12	7,10	11,12
Penta D	8,9,12,13	12,13	8,9
Amelogenin	X,Y	X,Y	X,Y
vWA	15,16,17,20	15,17	16,20
D8S1179	14	14	14
TPOX	8,9,11	8,9	9,11
FGA	21,23,30	21,23	23,30

These statistics were impressive to the scientists, detectives and prosecutors, but also to the jurors. In two separate trials, both suspects were convicted of first-degree murder. The defense attorney of one of the men acknowledged to the local media, "the DNA evidence had a definite impact on the jury". In conclusion, not only did this case bring justice to the family of a murder victim, but it also brought instant credibility to our laboratory and its work.

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REFERENCE

1. Esteban, P. New York man convicted of killing. *The News Journal*, June 7, 2003.