

PRESENTING Y-CHROMOSOME DNA EVIDENCE IN COURT

Peter de Knijff, PhD

LUMC Pre-Klinisch Laboratorium, Leiden, Nederlands



By means of a number of commercially available kits it is now possible to identify highly reliable Y-STR profiles for routine forensic casework. However, in contrast to reporting the results of an autosomal STR profile, the interpretation and presentation of matching Y-STR profiles in court can be prone to serious misunderstandings for a number of reasons:

- It is a simple fact of life (and genetics) that all patrilineal related male relatives of a single multi-generation pedigree will share an identical Y-STR profile (or haplotype).
- Because of this patrilineal inheritance pattern, Y-STR profiles co-segregate with surnames in many western societies.
- In many European countries male relatives tend to live close together in a rather small geographic area.
- Identical Y-STR profiles can be "shared by state" due to recurrent mutations of the STR loci involved.
- Estimated haplotype frequencies can be seriously misleading due to the fact that the database from which the frequency estimate was obtained not always truly represents the relevant population to which the suspect belongs.

Each of these issues should be considered when reporting and discussing the Y-STR match. In my presentation I will discuss each of these issues in the context of Dutch-casework. My approach in such cases is always very careful, and might be criticized because of this. Considering the complexities and uncertainties related to reporting a Y-STR match one might even wonder "why use these loci at all?" Here I always point to the many cases where suspects are excluded from being the perpetrator of a crime only on the basis of non-matching Y-STR profiles. Moreover, even in the case of matching profiles one presents the prosecution one valuable piece of technical information namely that we do not exclude the suspect from being the perpetrator. It is their job to use this piece of information. This sometimes leads to the apprehension of a male relative of the original suspect as the true perpetrator.