Proposed Forensic Quality Standards

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Recently, the DNA working groups of Europe, North America and Australia/New Zeeland respectively (e.g. ENFSI DNA Working Group, SWGDAM and BSAG) published a statement concerning issues around DNA contaminations from consumables and other sources.

Although this potential problem is known by people in the forensic field it has been turning out to be most relevant in the recent years because of increased analytical sensitivity and the extended use of crime scene sampling from areas only suspected to contain cellular material of a potential offender.

One of the most prominent cases was the police investigation of the German “Phantom of Heilbronn”, a series of female DNA profiles that matched dozens of crime scenes in Germany and Austria between 2001 and 2009. In 2009 it turned out that the profile found in so many crime scene samples originated from a woman involved in the manufacturing process of cotton swabs. Although the swabs were sterile for medical use they contained enough cellular DNA to obtain good DNA profiles.

There are two general ways of dealing with contamination: first and best is to avoid contamination and second, if contamination can not be excluded measures need to be in place to detect it.

It is also necessary to look at the different steps in the forensic process where contamination can occur, e. g. sampling, documentation, other forensic areas (e.g. fibre examination) and the forensic DNA laboratory. At each of those steps either the material or the people involved can be the source of a contamination. Regarding the consumables it is planned to develop a certifiable manufacturing standard stating that a certain product is fit for purpose.

Measures for contamination detection could include elimination databases of crime scene personnel, lab staff and possibly also of people involved in the manufacturing process. Proper tracking of material used can also aid in the evaluation of doubtful profiles.