

LETTER TO THE EDITOR

Open Access



# Increasing acceptability of forensic DNA analysis in Pakistan

Rana Muhammad Mateen<sup>1\*</sup> and Asma Tariq<sup>2</sup>

## Main text

Forensic DNA analysis has been a part of many criminal investigations and is now considered as the gold standard in the field of forensic science. It has a tremendous capability and potential to solve cases not found in other forensic fields (Lynch 2003). Probability calculations resulting from DNA profile comparisons are so unique that individualization of a perpetrator can be achieved easily. It was perceived in the past that DNA technology had limitations in separating identical twins; however, recent advancements in the field of DNA forensic science have shown that with the help of additional genetic loci, even identical twins can be separated easily (Weber-Lehmann et al. 2014).

In Pakistan, the ongoing terrorist attacks, mass disaster victims, and increasing missing persons in natural disasters called for effective measures at the government level for the identification of the individuals. Since 2006, efforts have been made at the government level for the development of forensic DNA analysis labs. Till now, four fully functional DNA analysis laboratories have initiated operations in Pakistan (Mateen et al. 2018). Punjab Forensic Science Agency (PFSA), being the largest forensic DNA laboratory in Pakistan, has been helping in solving rape, murder, dead body identification, sibship, and parentage cases. Having started its operations since 2012, PFSA has received approximately 44,417 cases for DNA analysis out of which 36,954 cases have been solved successfully while approximately 7463 cases are pending for several reasons (DNA and Serology Department n.d.). One of the landmark cases solved in Pakistan is the famous Zainab's murder case. The suspect had committed 12 cases of sexual assault and murders within a radius of 2.5 km. Extensive crime scene investigation led to the apprehension of the suspect, whose involvement in all the cases was confirmed with the help of DNA testing. A total of 1187 samples were collected for DNA analysis, whereas

the 814th sample proved to be of the criminal (Solving Zainab's Murder Case n.d.; Mateen and Tariq 2019).

Despite eye-witness importance, Pakistani courts are now relying heavily on DNA-based evidences which are probabilistically measurable and also help in getting rid of false witness statements often encountered in the courts. Zainab's murder case, solved through DNA analysis, has also led to public awareness regarding the importance of forensic DNA analysis in solving cases. In addition to PFSA, other laboratories working in the country are going towards capacity building. As far as statistical weightage of DNA evidence is concerned, development of local population DNA database, for allele frequency calculation, is still desired in the country. It has been reported that, by applying certain correction factors, allelic frequencies in a related population can be calculated (Bodner et al. 2016), but correct DNA weightage still demands the allelic frequency calculations in a given population, as these represent the true DNA evidence weightage after statistical analysis.

## Abbreviations

PFSA: Punjab Forensic Science Agency

## Acknowledgements

Not applicable

## Authors' contributions

RMM contributed to the conceptualization, data collection, and writing of the manuscript. AT contributed to the data collection and final revision of the manuscript. Both authors read and approved the final manuscript.

## Funding

Not applicable

## Ethics approval and consent to participate

Not applicable

## Consent for publication

Not applicable

## Competing interests

The authors declare that they have no competing interests.

## Author details

<sup>1</sup>Department of Life sciences, School of science, University of Management and Technology, Lahore, Pakistan. <sup>2</sup>Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore, Pakistan.

\* Correspondence: [mateenibb@yahoo.com](mailto:mateenibb@yahoo.com)

<sup>1</sup>Department of Life sciences, School of science, University of Management and Technology, Lahore, Pakistan

Full list of author information is available at the end of the article

Received: 30 July 2019 Accepted: 26 September 2019

Published online: 24 October 2019

#### References

- Bodner M, Bastisch I, Butler JM, Fimmers R, Gill P, Gusmão L et al (2016) Recommendations of the DNA Commission of the International Society for Forensic Genetics (ISFG) on quality control of autosomal Short Tandem Repeat allele frequency databasing (STRidER). *Forensic Sci Int Genet* 24:97–102. <https://doi.org/10.1016/j.fsigen.2016.06.008>
- DNA and Serology Department, Punjab Forensic Science Agency, Lahore [https://www.pfsa.gop.pk/dna\\_caselog](https://www.pfsa.gop.pk/dna_caselog). Accessed on 30 July 2019
- Lynch M (2003) God's signature: DNA profiling, the new gold standard in forensic science. *Endeavour* 27(2):93–97. [https://doi.org/10.1016/s0160-9327\(03\)00068-1](https://doi.org/10.1016/s0160-9327(03)00068-1)
- Mateen RM, Tariq A (2019) Crime scene investigation in Pakistan: a perspective. <https://doi.org/10.1016/j.fsisyn.2019.06.046>
- Mateen RM, Tariq A, Rasool N (2018) Forensic science in Pakistan: present and future. *Egypt J Forensic Sci* 8(1):45
- Solving Zainab's Murder Case. <http://www.technologyreview.pk/solving-zainabs-murder/>. Accessed on 20 July 2019
- Weber-Lehmann J, Schilling E, Gradl G, Richter DC, Wiehler J, Rolf B (2014) Finding the needle in the haystack: differentiating 'identical' twins in paternity testing and forensics by ultra-deep next generation sequencing. *Forensic Sci Int Genet* 9:42–46. <https://doi.org/10.1016/j.fsigen.2013.10.015>

#### Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- ▶ Convenient online submission
- ▶ Rigorous peer review
- ▶ Open access: articles freely available online
- ▶ High visibility within the field
- ▶ Retaining the copyright to your article

---

Submit your next manuscript at ▶ [springeropen.com](https://www.springeropen.com)

---