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# Technology in Criminal Justice

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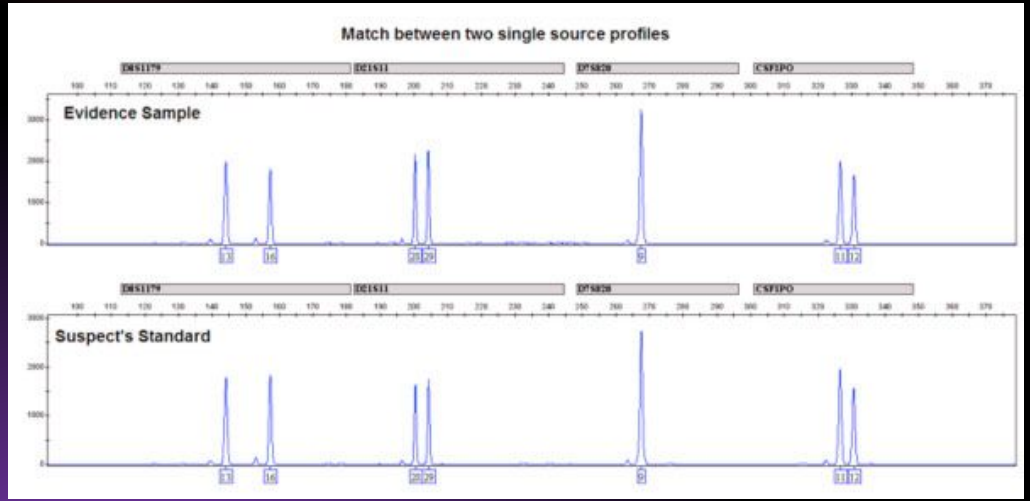
# Introduction

Technology is transforming how crimes are solved and justice is served. In this presentation, we'll focus on DNA technology and its impact on the criminal justice system today. Technology in criminal justice has helped bring justice to victims and freedom to the wrongly accused. It makes the system more fair, more accurate, and more structured in science. However, just like any other powerful tool, it has to be used carefully and with caution, we also need to remember that this tool can also be incorrect and it has its advantages, as well as, disadvantages.

# What exactly is DNA technology?

DNA is a genetic fingerprint unique to every single individual. In forensics, DNA is collected from crime scenes. Forensic scientists collect elements such as: blood, hair, skin cells

Lab machines analyze short tandem repeats to create a DNA profile. A short tandem repeat also known as a STR is short DNA sequences, that are repeated numerous times in a row in the genome. Profiles can be matched to suspects, victims, or national databases like CODIS, helping solve the crime and find the suspect.



# History of DNA in Criminal Justice

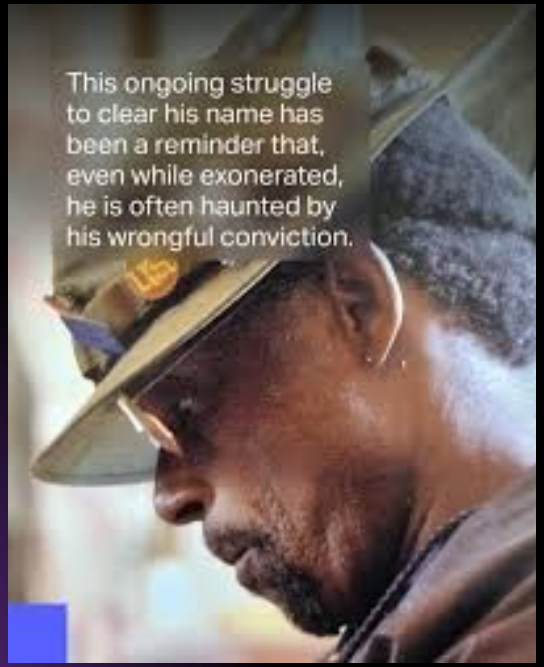
The first criminal case that required the use of DNA occurred in the UK in 1986. In this case DNA helped prove a suspect's innocence. Instead of the individual being incarcerated for nothing he was set free and technology made that right. Not only did it help free an innocent man it captured and imprisoned the actual aggressor, Colin Pitchfork. In the United States Criminal Justice system, DNA was first used in court in 1987 in the court case People v. Wesley.

Early DNA tests were costly and slow now transitioning to modern day, methods are faster and more precise. DNA's role has expanded from murder and rape cases to property crimes and missing persons. Helping solve minor and major crimes that might not have ever been solved before. They aid scientists with ease and with more accuracy.

# Freedom through DNA

The Innocence Project helps free people wrongly convicted using post-conviction DNA testing. This project was founded because people started to realize the power of DNA testing in ending wrongful convictions. Now there are over 375 innocent people freed in the United States since 1989.

An example of an individual who was recognized by the innocence project is Anthony Wright. He spent 25 years in prison before DNA proved his innocence and was later released. DNA can uncover police misconduct, eyewitness error, or flawed forensic techniques



# Example: Golden State Killer

- Joseph James DeAngelo - Suspect
- He was identified in 2018 after 40+ years of unsolved crimes and unanswered questions.
- Investigators ultimately used DNA from crime scenes and from public genealogy websites
- Next investigators used technology to find a relative's DNA. They used that DNA to build a family tree, and by doing that they were able to locate Joseph DeAngelo.
- This is a example of genetic genealogy solving cold cases and how it gives investigators an advantage without doing a ton of extra work.

# Challenges and Risks

**Cost:** Not every police department can afford high-tech labs

**Database gaps:** DNA profiles aren't always available, especially for non-convicted individuals

**Over Reliance on DNA:** Prosecutors may treat DNA as the only evidence that matters, ignoring context, motive, or witness testimony, which are very valuable aspects.

**Contamination:** Small errors at a crime scene can affect results

**Overreliance:** Prosecutors may ignore other evidence if DNA seems strong

# Privacy and Legal Issues

**Consent:** Some websites share user DNA without full awareness. This raises a lot of flags and individuals see this as unethical.

**Surveillance:** Should people be tracked through their relatives' DNA? Even though this is legal should it be considered as illegal? In my opinion, there needs to be clearers laws set in place because it seems invasive without a reasoning.

**Discrimination risks:** Unequal Representation in DNA Databases: National databases databases often include profiles from individuals who have been arrested or convicted. Due to disparities in policing, certain communities; especially Black and Latino populations are overrepresented. This leads to disproportionate surveillance and make these groups more likely to be investigated in future cases which portrays an unfair bias.
**Example:** Maryland v. King occurred in 2013: Supreme Court allowed DNA collection from individuals who were arrested.

# Benefits of DNA technology

**Accuracy:** DNA evidence is alot more reliable than eyewitnesses or polygraphs. This is because there can be things that affect both an eyewitness report and polygraphs.

**Cold cases:** Solves investigations from decades ago

**Efficiency:** Speeds up cases and reduces false accusations

**Objectivity:** Reduces bias compared to subjective testimony

**Crime Prevention:** Matching a suspect's DNA in one case may prevent future crimes by identifying serial offenders. CODIS helps stop repeat criminals early. Extremely useful in verifying alibis, helping clear innocent suspects early in the process

**Broader Applications:** DNA can identify missing persons and disaster victims. Also, helps in mass casualty identification and human trafficking investigations

# Other aspects of Tech in Criminal Justice (besides DNA evidence)

**Body cameras:** Increase police accountability and transparency

**Facial recognition:** Used at airports and by police. This can also raise racial bias concerns

**Predictive policing:** Uses data to identify high-crime areas. A downfall to this is that it might reinforce bias. Its important to remember that all tools must be balanced with ethics, training, and the proper oversight.

# Conclusion

DNA technology as well as technology in criminal justice has slowly started to change the way we perceive guilt and innocence. In the past, someone could be convicted based on just one eyewitness or a confession under pressure, and we would think that is enough to put them in jail for years. In present day, a tiny strand of hair or a drop of blood can tell a broader story and ultimately expose the truth.

This technology has helped bring justice to victims and freedom to the wrongly accused. It makes the system more fair, more accurate, and more grounded in science. But like any powerful tool, it has to be used carefully.

We still face big questions: Who has access to our DNA? Should police be able to use information from genealogy websites? How do we protect people's rights while still solving crimes?

The truth is, technology alone doesn't guarantee justice—**it's how we use it that matters.** The future of criminal justice depends not just on innovation, but on responsibility, transparency, and fairness.

# References

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# THANK YOU

Any questions?