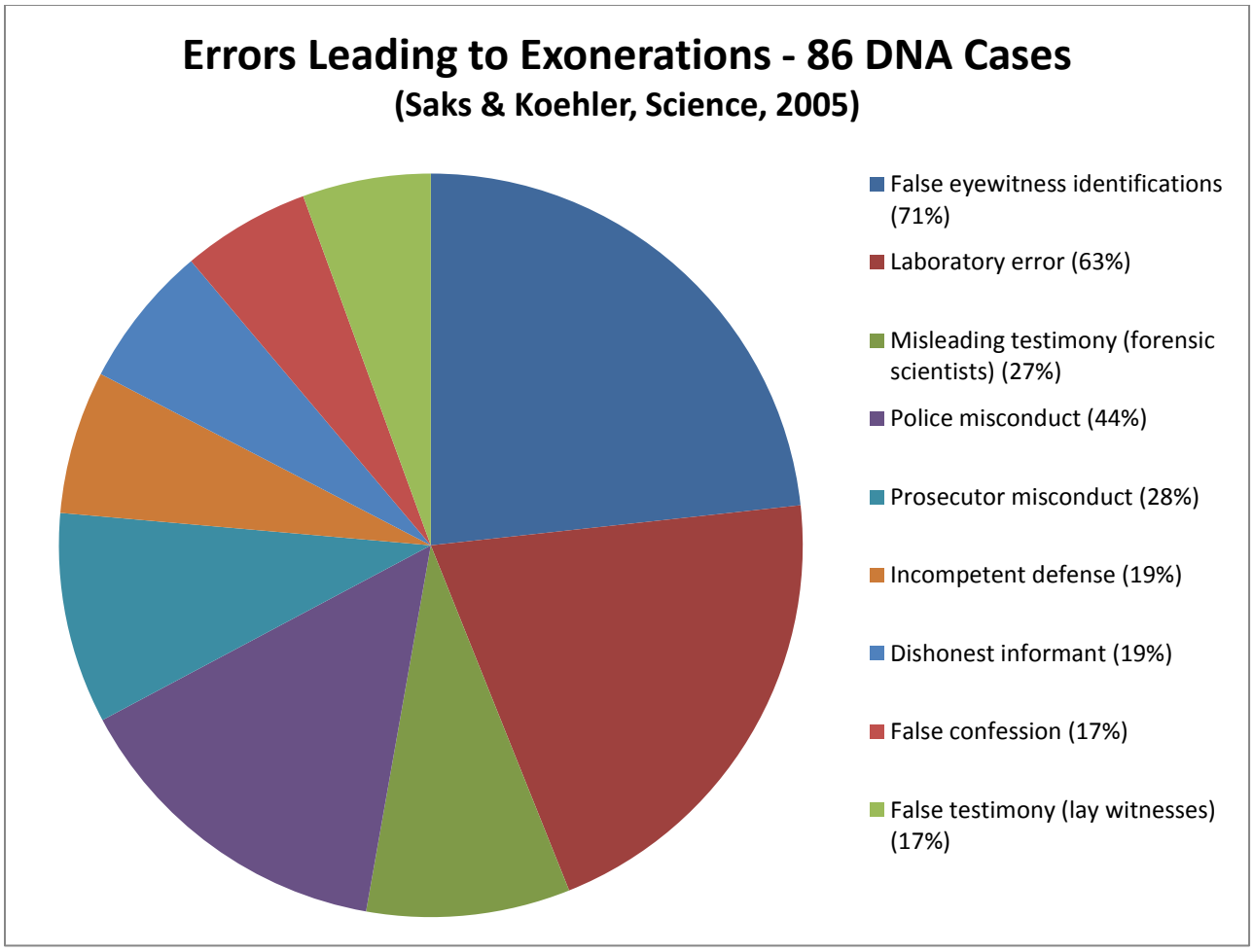
DNA is invisible until a fluorescent tag is added during the PCR testing steps for human identification in forensic casework. From start to finish, technical expertise is required to achieve a valid scientific result. In addition, the interpretation of DNA results is often not as obvious as one might think, especially in casework with large numbers of samples from a crime scene, genetic relatives, scenes with a large numbers of contributors, or samples consisting of complex mixtures of DNA profiles. The best interpretation of the data is achieved by using consistent policy based on scientific accuracy and peer-reviewed forensic guidelines.

Evaluation of DNA Evidence in Forensic Casework

IDENTACODE NEWSLETTER

Quality assurance refers to an overall program at a forensic science laboratory that accurately identifies key points in evidentiary processing that are critical to maintaining the scientific integrity of the system (example – auditing). Quality control refers to the step by step process that insures the validity of the scientific results in any given method or procedure (example- use of positive and negative controls).


Errors Leading to Exonerations - 86 DNA Cases
(Saks & Koehler, Science, 2005)
False eyewitness identifications (71%)
Laboratory error (63%)
Misleading testimony (forensic scientists) (27%)
Police misconduct (44%)
Prosecutor misconduct (28%)
Incompetent defense (19%)
Dishonest informant (19%)
False confession (17%)
False testimony (lay witnesses) (17%)

Evaluation of DNA in Casework - Checklist

1. Has the history of the key probative pieces of DNA evidence been tracked from crime scene to final laboratory report via chain of custody?
2. Is there any other potentially more probative or valuable evidentiary items for DNA in the evidence list?
3. Did the laboratory conclusively identify the substance from which the DNA profile was generated by serological testing?
4. Is there a chance the DNA profile is due to a mixture of sources or is it a single source DNA profile?
5. Has an evaluation of the chance of adventitious or coincidental matches been done?
6. Did the laboratory run both positive and negative controls and did they function properly?
7. How much DNA did each sample contain and does it make sense with the results obtained?
8. Are any close genetic relatives involved in the case that could be contributors to partial DNA results or DNA mixtures in the case?
9. Is there any evidence of weak contributors to a case that were unreported and potentially exculpatory?
10. Were the DNA statistics for the case calculated correctly and applied correctly to the DNA case?
11. Were the samples evaluated in a blind unbiased manner?
12. Were there any inconsistencies in the "match" statistics (any missing or additional alleles that are unaccounted for by a scientific explanation)?
13. Do the overall DNA results make sense in the context of the case or is there an alternate explanation for the DNA data?