



Evidence items from one or more crime scenes can fit together to tell a story. DNA from a hat, gun, phone or countertop – whatever was touched, handled or worn – can build an investigative map of criminal activity.

# DNA maps the crime scene

## Kern County, CA gang robberies

Building an investigative DNA map is only possible with robust DNA interpretation. However, some crime lab limitations prevent the interpretation of evidence. Low-level touch DNA mixtures stream in through the door, along with investigator expectations of fast, accurate results. Key DNA is often deemed “inconclusive,” and key comparisons are left behind.

### Enter the computer

A computer can map out crime scenes by comparing evidence genotypes with references to identify suspects. With computer assistance, a forensic analyst can translate an investigator’s dream into evidentiary reality. In the following case, TrueAllele computer interpretation unmixed, solved and compared all of the touch DNA mixtures.

### Serial robberies

In Kern County, CA a gang was suspected of committing a series of store robberies. They raided a food mart, leaving behind a hat and a gun with their DNA. Then they robbed a hardware store, leaving DNA on a safe and a phone. After that, they struck a jewelry store, depositing DNA on a countertop and left a hat. The gang attacked more stores, leaving behind keys, a hat and clothing as biological evidence items.

As the violence escalated, resolving these crimes became increasingly important. The STR peak heights were low (many under 50 rfu), and the mixture complexity was high (most items having 3 or 4 contributors). Comparisons were needed with 10 reference genotypes, half suspect and half victim.

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## Kern County robberies



### Overwhelming evidence

Consider the DNA interpretation task. There were 12 low-level DNA mixture evidence items, each containing 3 or 4 contributors. There were also 10 different references. So 120 (12 x 10) match comparisons were needed.

The comparisons would have been prohibitively laborious by hand. But with computer assistance, a forensic analyst can quickly solve mixtures and make comparisons to identify suspects. Thus, for this series of gang crimes, the Kern County crime lab sent all their DNA data to Cybergenetics for TrueAllele computer interpretation.

### Computer solution

The TrueAllele computer separated out the genotypes in the DNA data, without referring to references. After separating out the genotypes, it made comparisons. Eight of the twelve mixture items matched a reference, with DNA match statistics ranging from thousands to quintillions.

### Trial outcome

Cybergenetics Dr. Mark Perlin testified about the TrueAllele results. The two defendants received sentences of 73 and 78 years.

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### More information

Watch Dr. Mark Perlin present “Unleashing forensic DNA through computer intelligence”

[www.cybgen.com/go/unleash](http://www.cybgen.com/go/unleash)

Read Dr. Perlin’s 2012 article, “DNA mapping the crime scene: do computers dream of electric peaks?”

[www.cybgen.com/go/mapping](http://www.cybgen.com/go/mapping)

Ask about a free TrueAllele demonstration on DNA case data.

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