



LOOKING FOR THE COLD HIT

TV shows like *CSI: Crime Scene Investigation* depict DNA evidence as a crime-solving panacea.

By [Bobbi Murray](#)

It was 2:34 a.m. when Detective Tim Marcia arrived at the crime scene one February night in 1999. The night's earlier drizzle had ended, the sky cleared by a chilly wind that fluttered the yellow crime-scene tape strung by Los Angeles Police Department patrol officers to secure the area, one apartment in a four-plex on a quiet street in the mid-Wilshire area.

The apartment was empty. The victim, Loretta Smith (not her real name), had been taken to the Rape Treatment Center in Santa Monica. Her attacker, who had sexually assaulted her for over an hour in her own home, had fled the scene.

But not without leaving a lot of evidence. Marcia still recalls the night vividly. *Repeat offender*, he remembers thinking, as he walked around the rear of the structure. *This crime scene just reeks of repeat*

offender. The perpetrator had tried two windows to get in, removing the screens, before getting in through an unlocked security door by breaking the window housing and reaching in to turn the knob.

The detective moved inside the apartment to collect evidence that could yield clues to the attacker's identity - a crystal bowl thrown to the ground, framed pictures of loved ones apparently tossed, a crumpled towel. "I think I had something like thirty pieces of evidence," he recalls.

Lots of it was biological in nature, loaded with DNA that could potentially identify an attacker. The rapist's semen was on a tissue. There would also be evidence collected from the body of the victim herself in an invasive procedure that can take hours, gathering biological samples that get packaged up into a bulky evidence envelope called, in an unfortunate turn of phrase, a "rape kit." And the attacker had drained a bottle of Hennessy cognac and tossed it on the couch, leaving, as Marcia earnestly explains, epithelial cells - which coat the inside of the cheek - all around the rim. "It's just great evidence," he says.

If this were like the TV show, *CSI: Crime Scene Investigation*, the rapist would be nailed. By the time you'd watched four commercials, they'd have that evidence in a dramatically-lit lab, delivering a DNA profile in minutes, and run a lightning-fast computer search of the national database called CODIS - the Combined DNA Identification System - a national database with over 1.8 million profiles, run by the FBI and which links state DNA profile databases. If the attacker was a repeater, there's a good chance they'd get a match, a "cold hit," and Marcia could ID the guy. Then it would be a matter of tracking him down, or, if he were already in custody, making sure he didn't get kicked loose. CODIS and the other DNA technology is available in real life, but Marcia found out real fast he's not living in *CSI*. A 19-year veteran of the LAPD, Marcia's the kind of guy people might describe as pretty tightly wrapped. He keeps his blond hair cropped close and dresses with color-coordinated care. He watches *The Forensic Files* on Court TV and trolls the Discovery Channel for similar programming to make sure he is up to speed. But even years later, you can hear the frustration in his voice as he describes trying to get his mid-Wilshire rape evidence analyzed.

LAPD's pitifully understaffed facility told Marcia it would take six to eight *months* to get the evidence tested. That was lots of time for a repeat sexual attacker to commit more rapes. Marcia called the California Department of Justice, and pushed to get the evidence processed at a state lab. But despite persistent pressure, there were just too many cases stacked up before his.

In Los Angeles, where *CSI* is produced, DNA technology is even slower than it is in many other places. In 1999, the LAPD crime lab had only two DNA criminalists on staff, and a backlog of thousands of cases. New York City was up to 85 criminalists. Now, 19 criminalist positions are funded for the LAPD lab, 16 of them filled. New York is up to 108; Chicago has 52.

The easy passage last fall of Proposition 69, a state ballot initiative that is expanding the state database by greatly increasing the number of persons who must submit DNA samples, demonstrates how much the public believes in this technology, but doesn't increase the funding for the local lab.

"Some people would consider homicide the most grievous offense that could be committed against another human being," Marcia says. "I would also say that sexual assault can be the most grievous thing, because they have to live with it for the rest of their lives."

Eight months later, forensic technicians generated a DNA profile of the suspect in the mid-Wilshire rape case, ran it through the CODIS database - and got a cold hit. The crime scene DNA matched that of Christopher Cardwell, who, it turns out, had done time for a previous rape - and had cut his cellmate's

throat. The detective found his suspect in custody in Texas on a burglary charge.

But in the ensuing months, while Marcia waited for the DNA analysis, Cardwell had raped at least two other women.

The Myth of Infallibility

There's no question the public is enthralled with the notion of DNA technology. The 1995 O.J. Simpson trial piqued an interest that has positively caught fire with the proliferation of top-rated cop shows, with their dashing cops and forensics people for whom DNA testing is a given, the fool-proof evidence on which many plots twist and hang. While these shows may be over-the-top in their depictions of super-swift, dead-on accurate forensics, the real-life potential of DNA technology, and how quickly it has advanced, is amazing enough to fascinate on its own.

At the time of the Simpson trial, a sample of blood, spit, or semen would have to be at least the size of a quarter to be big enough to extract DNA and generate a profile. Now, scientists can take a few cells from the nosepiece of a pair of glasses, or the saliva left on a cigarette butt and come up with a profile. Databases have ballooned; law enforcement in the state of Virginia, for instance, collects DNA from everyone arrested for a felony with a buccal swab from the inside of the cheek; in the wake of Proposition 69, California authorities will begin doing so in 2009.

Forensic DNA has achieved a mythic reputation for infallibility. But all the TV exposure may be setting us up for false expectations.

"There's quite a bit of variation on the nature and quality of DNA evidence," says Dr. William Thompson, a professor at the UC Irvine Department of Criminology, Law and Society. "Just because it can be good, and often is good, doesn't mean that it's always good." Newport Bay breezes fill Thompson's office, lending the air a golden quality. The high-ceilinged room is full of dense laboratory reports that include pages of images that resemble the peaks and dips of an EKG read-out. Those are electroseriograms, images of DNA profiles.

The sunny setting contrasts markedly to the darker stuff that occupies his time - Thompson was recently part of a successful effort to get a new trial for an Oklahoma man convicted of murder. This case demonstrated exactly how overzealous prosecutors can twist supposedly unimpeachable DNA evidence to meet their needs: The accused's DNA profile matched crime scene evidence on only two genetic markers out of a possible 25 - a very low number, especially when a life depends on it.

Thompson is an expert in looking at DNA analysis and the way forensics people, lawyers, and juries reach conclusions about the results - sometimes the wrong ones. He has reviewed hundreds of cases from all over the world in the 20 years that DNA technology has rapidly evolved. And he's found a significant number of misinterpretations and what he calls "bad science." Some professionals in the forensic community characterize Thompson as a naysayer, but he absolutely believes in the positive potential of forensic DNA. He's just worried about the rigor of the science in many prosecution-pressured crime labs.

There's a strong human tendency to skew ambiguous evidence, he says. "People get into such a mindset about 'Here's the guilty guy and here's the evidence' that they don't even think there's a number of alternative interpretations" for what they see.

In reality, interpretation of DNA evidence leaves a lot of wiggle room. Technicians must look for a particular genetic marker at a particular spot on the microscopic strand of double-helix, like looking for a house number on a particular street. But it gets tricky - sometimes there are genetic markers in an evidence sample that are difficult to account for, or maybe there could be a mixture of DNA from many people on a piece of evidence, so that technicians have to piece together the DNA profiles of all those who left DNA on the evidence. Or maybe there isn't enough material to come up with a full profile. It all leaves room for interpretation.

"Labs will issue very conclusionary reports," says L.A.'s head Deputy Public Defender Mark Windham, an expert in defense interpretation of DNA evidence. The DNA reports attorneys receive is not the raw data, but edited by the analysts, Windham says. That's why the defense needs to look at it and know how to interpret it - the prosecution certainly won't. Even defense attorneys, he says, buy the myth of infallibility and don't challenge the findings.

This issue of DNA lab bias positively blew up three years ago at the Houston Police Department Crime Lab. Thompson, called in by a local TV news department to scrutinize the DNA evidence in eight cases, found sloppy science, fudged test interpretations, skipped steps, and bad scientific method at the Houston lab.

One of those cases was that of Josiah Sutton. He was just 16 when he was jailed for rape and released over four years later - *after* Thompson reviewed his case and found absolutely no match between Sutton's DNA profile and key biological evidence at the scene, the back seat of a car where the rape had taken place. After Sutton's release, a juror told the *Houston Chronicle* that he wouldn't have voted to convict without the DNA evidence.

The Houston DNA unit was shut down in 2002 and remains closed, while hundreds of cases are reviewed and the evidence re-tested.

No scandal of this magnitude has touched the LAPD crime lab, and there are ways to guard against it. It can be as simple as making sure the analyst testing the material doesn't know the identity of the person under suspicion. But even when law enforcement defends itself against overzealous prosecutors, plain old bureaucracy can confound the best intentions. The issues faced by Det. Marcia are Exhibit A: Back when he was working the mid-Wilshire rape, the crime lab assigned priority for DNA analysis to cases going to court, not those where a profile could help find a suspect. So Marcia's case sat unattended.

In 1999, then-Chief Bernard Parks was less than gung-ho about making forensic DNA a funding priority. He was discouraged by what he saw as a too-scanty state database and the difficulty of hiring DNA technicians. During an interview on the subject while he was still chief, he wondered aloud if it helped or hurt to have a basically incomplete set of DNA tools, saying, "Does that overwhelm or cause the system to disintegrate if you don't have the people to analyze [the DNA evidence]? Then once you do the analyzing, is the system in default because you don't have a database to compare it with?"

At the time of Loretta Smith's attack, Attorney General Bill Lockyer developed a \$50 million grant to reduce a backlog in unprocessed test rape evidence that was calculated at over 20,000 cases statewide.

That funding helped clear the backlog at the LAPD, and, these days, no-suspect rape cases get into the queue a bit faster, with an average of 90 days from when a detective checks in a rape evidence kit to the time lab criminalists generate a DNA profile. It's still long enough for a perp to do more damage, but better

than it was. Current Chief William Bratton is a forensic DNA enthusiast and District Attorney Steve Cooley has also pressed for more resources devoted to it.

"The urgency of no-suspect cases is more than it used to be," reports Greg Matheson, assistant director of the LAPD crime lab.

Widening the Net

There was never much doubt that voters would approve Proposition 69 in November. It was ahead in the polls all the way. Its estimated cost is \$20 million annually and will add the genetic profiles of all convicted felons to California's DNA database, no longer limited to violent offenders, as the law had previously stipulated. In 2009, Prop. 69 will widen the net so that anyone even arrested on a felony charge will be required to have his or her genetic profile entered - whether or not there's a conviction.

Proposition 69 will put state authorities under pressure to collect and process the new DNA samples and add the profiles to the database. Local crime labs shouldn't experience an increased workload, according to an LAPD crime lab source. But without changes at the local level - both in L.A. and throughout the state - will Proposition 69 really make a difference? It seems that the local crime lab will always be the impediment to making swift IDs.

Besides, it might just be unconstitutional. The American Civil Liberties Union has sued to strike the measure down. Judge Fern Smith of the U.S. District Court last Thursday said she would take the ACLU's Fourth Amendment arguments under consideration. There are many worrisome aspects, says Southern California ACLU attorney Ricardo Garcia. It's overly intrusive. The ACLU says there are some 50,000 arrests every year in California in which no charges ultimately are filed - but Prop. 69 says all the felony arrestees can still be compelled to give a sample beginning in 2009.

The ACLU understands the language of the initiative to mean that people wrongly arrested for felonies now could get a knock at the door and demand for a DNA sample in 2009. "It's stigmatic," Garcia says. Attorney General Lockyer has issued a letter saying that the requirement would not be retroactive, Garcia says, but that's not binding on local law enforcement or Lockyer's successors.

The database expansion concerns DNA skeptic Thompson from a different angle. He worries about what he calls "inferred mixtures." He cites as an example a case in Virginia where a fake beard was used in a robbery. There was a mixture of DNA from several people, but no one distinct DNA profile.

The lab, he says, had to "infer what the different contributors' profiles might be. They had to search these and they conducted like, 18 different searches of all the different possibilities." Forensic technicians take the numbers of all the genetic markers they find and enter possible combinations into the database in hopes of getting a hit. That's very different from entering in one possible profile, with a specific set of genetic markers in a particular order to see if you get a match - it's more like a fishing expedition.

Thompson, in fact, refers to it as "widening out the net." He finds it especially troubling that, even if a person is not convicted, it takes a court order to remove a profile from the database - and then there is no legal requirement to remove it.

"Wealthy people can get court orders, poor people can't," Thompson says.

The ACLU expects a ruling soon on its legal action against Prop. 69, even as the measure's implementation is going ahead full steam.

Hovering Near the Bottom

Detective David Lambkin, who runs the LAPD's Robbery Homicide Division's Cold Case Unit, started with the department in 1982 and is considered a legend by his some of his staff. He even has fans among defense attorneys - public defender Windham calls him a good guy. Lambkin comes across as self-deprecating and low-key, but he's a more-than-can-do guy, who once plunked down his own credit card rather than wait any longer for fingerprint scanner software long-delayed by bureaucratic snafus.

Lambkin is glad about Proposition 69. "My personal belief is that the number of DNA hits is going to go up fourfold," he says. He's heard it will add some 130,000 DNA profiles to California's database - around 80,000 from within the prison system and 53,000 to be taken from those on felony parole. Even with all he's seen in 23 years, he still thinks the DNA system is not up to snuff.

"Our lab resources in terms of personnel are severely lacking in comparison with any law enforcement agency in the United States," Lambkin says.

When Loretta Smith and two other women were raped in 1999, the LAPD crime lab had only two DNA criminalists cleared for casework - this in a city of over three million people, a situation that prompted Deputy District Attorney Lisa Kahn, a nationally recognized expert on DNA, to lament in 2002: "We're behind Alabama, we're behind Virginia, we're behind New York - you'd have to put L.A. City at the very bottom of the list" in forensic DNA capability.

It's a bit of a stretch to say that Los Angeles is at the very bottom - many states and cities have a shortage of DNA analysts. But the number of slots designated for DNA criminalists at the LAPD crime lab is relatively small. The lab now has funded positions for 19 DNA criminalists and five lab technicians, says Matheson, the lab's assistant director, but the DNA analyst staff is down three, to 16, and there's only one lab technician.

"My feeling is that's skimpy," observes Dr. Robert Shaler, director at the Department of Forensics in the Medical Examiner's Office for the City of New York. Shaler is known nationally as a kind of forensic DNA guru.

Matheson frames it as an issue of space, pointing out that the present crime lab, designed in 1983, long before DNA technology as such existed, was designed for a staff of eight. Things should get much roomier in 2006, when a new crime lab facility to be occupied by both the LAPD and L.A. County Sheriff's Department lab opens at the Cal State Los Angeles campus. Matheson says that there will be space for 36 criminalists at the new place.

But 36 DNA criminalists will scarcely get at DNA technology's potential for solving and preventing crime, if one is to take the numbers deployed in New York City seriously.

"We get 3,200-3,500 cases a year. We have no backlog," says Shaler, the head of the department. Turnaround time on rape kits in New York "is hovering around 60, 65 days," he says. "That's still not good enough. You want to get it below 60." It's still a good month faster on average than it takes to process a kit in the City of Los Angeles.

Matheson takes the glass-is-half-full approach. The City Council is increasingly receptive to requests for funding and the lab has won authorization for more positions over the past couple of years, he says. But at a time of tight budgets when the loudest political priority is to hire more LAPD officers, forensic resources are likely to get slighted. "I don't think it's a trade-off, one over the other," Matheson says. "The public wants to hear that they're hiring more police officers - they're the ones that show up at the door."

The backstory on how New York found resources to ramp up capacity underscores how ephemeral the politics of crime reduction can be. In 1996, the Medical Examiner's office still had only 35 DNA analysts, a handful in a city of eight million people, and might have continued bumping along that way. But in 1997, then-Police Commissioner Howard Safir decided that it was urgent that funds be found to increase capacity, and pressed then-Mayor Rudolph Giuliani to find \$12 million - this at a time when the economy was sturdy and there was that kind of money to be found.

Safir explains that he had been unaware of the potential of DNA analysis to solve and prosecute crime until, of all people, high-profile defense attorney, Barry Scheck, drew his attention to the issue. Scheck, along with Peter Neufield, established the Innocence Project at Cardozo School of Law, which has exonerated 127 death row-bound people using DNA evidence.

He may be more famous for his role as part of O.J. Simpson's defense team in 1994, when Scheck famously beat the daylights out the LAPD crime lab's credibility, calling it a "cesspool." Safir says he hardly welcomed the attorney with open arms. "I thought: *he's the guy who got O.J. off*," Safir says now. Scheck told Safir that there were 12,000 rape evidence kits piled up in New York.

"When we looked, we found 16,000," Safir recalls.

Shaler was brought in to oversee the expansion of the lab and moved New York's forensic DNA capacity from a horse-and-buggy level to among the foremost in the nation.

He is also an advocate of transparency and investigations of any appearance of wrongdoing. He observes that the day-to-day pressures on crime labs to complete cases and provide evidence for investigations and prosecutions make mistakes inevitable.

Even at his lab "we've had our problems," he says. "We've had one person who contaminated evidence." Another monkeyed with the lab process. He saw to it that they were investigated, went to the D.A.'s office and reviewed all the cases in which they were involved. Shaler had no interest in covering up. "I'm not in a hiding position," he says. "It's good for the field that these things get exposure."

It Ain't Easy

Christopher Cardwell, the suspect snagged by his own DNA in the mid-Wilshire rape and two others, was tried and convicted in June 2003. Five of his victims over 20 years testified at the trial. Marcia was in court

every day, escorting the witnesses to the stand. Cardwell was sentenced to 650 years-to-life. Both Marcia and the D.A.'s office call it the correct outcome.

DNA skeptic Thompson reviewed the DNA evidence in the case and found it sound. "He should be locked up," Thompson opines. But he continues to pick his way through a field scattered with political land mines, and doesn't back away from pressing for scientific rigor and the monitoring of the supposedly infallible science of forensic DNA.

"It looks really easy on *CSI*," he says. "But experience around the country shows it's not that easy."

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