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Thursday, July 22, 2004

# Rare look inside state crime labs reveals recurring DNA test problems

By RUTH TEICHROEB  
SEATTLE POST-INTELLIGENCER REPORTER

For the detective working the case, it looked like a sure thing. The 58-year-old suspect had confessed to raping his young niece. He had a prior sex-crime conviction.

DNA evidence extracted from the 10-year-old girl's underwear would be the clincher.

Charged with child rape, the road-crew worker from the South King County town of Pacific faced up to 26 years in prison -- until authorities learned of startling test results coming out of the Washington State Patrol's Tacoma crime lab.

The genetic evidence excluded the victim's uncle and pointed to an unknown man. The airtight case suddenly had a gaping hole.

Four months later, on Jan. 8, 2002, prosecutors offered a deal. The defendant pleaded guilty to a lesser charge of child molestation, shaving a decade off his sentence.

A couple of weeks after that, the lab made an embarrassing discovery.

The mystery man was a mistake.

Forensic scientist Mike Dornan had bungled the test, accidentally contaminating the child's clothing with DNA from another case he'd been working on.

DNA contamination and errors at the State Patrol crime labs are recurring problems, an investigation by the Seattle Post-Intelligencer has found.

Forensic scientists contaminated tests or made other mistakes while handling DNA evidence in at least 23 cases involving major crimes over the last three years, according to State Patrol and court records.

The list of DNA testing errors, uncovered through public-records requests and interviews with defense attorneys and experts, offers an unusual glimpse into what can go wrong. Crime labs across the country are struggling with similar problems but documented evidence has been hard to come by.

The State Patrol cases reveal that the technology has an Achilles' heel: human error.

Forensic scientists tainted tests with their own DNA in eight of the 23 cases. They made mistakes in six others, from throwing out evidence swabs to misreading results, fingering the wrong rape suspect. Tests were contaminated by DNA from unrelated cases in three examinations, and between evidence in the same case in another. The source of contamination in five other tests is unknown.

Every cell in the human body contains a copy of a person's unique DNA, or

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**zoom** Dan DeLong / P-I  
Under a hood to help prevent contamination, Washington State Patrol forensic scientist Brian Smelser prepares DNA samples for testing in Marysville.

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deoxyribonucleic acid, a microscopic foot-long strand that determines eye color, height and other inherited characteristics. A DNA match is considered infallible proof of guilt or innocence in many crimes.

Sophisticated DNA testing has played a crucial role in high-profile cases, including the crime lab's work in helping put Green River Killer Gary Ridgway behind bars for life last year and cracking a number of "cold-case" murders.

Crime lab officials here and elsewhere don't like to talk about the fact that the same test that can link someone to a crime scene with a few minuscule cells left on a doorknob can also be contaminated by a passing sneeze. Or that DNA tests are only as reliable as the humans doing them -- a troubling prospect when dealing with evidence that has the power to exonerate suspects or imprison them for life.

"The amazing thing is how many screw-ups they have for a technique that they go into court and say is infallible," said William C. Thompson, a forensic expert and professor of criminology and law at the University of California-Irvine, who reviewed the incidents at the request of the P-I.

"What we're seeing in these 23 cases is really the tip of the iceberg."

That's because the lab is only catching obvious cases that likely signal more widespread problems, Thompson said.

State Patrol lab officials disagree, saying they have strict protocols in place that guarantee these incidents represent only a tiny fraction of the 1,400 DNA cases handled each year.

"We're as good as any lab and probably better than many," said Barry Logan, who as director of the crime labs -- the Forensic Laboratory Services Bureau -- oversees a \$21 million biennial budget and seven labs processing evidence for the bulk of Washington's criminal cases.

Although the labs only recently set up a mandatory reporting system for DNA mistakes, officials are "100 percent certain that with all the precautions we catch everything," said Gary Shutler, who supervises the lab system's DNA work.

That's almost impossible to measure because the overburdened lab system, faced with a rapidly expanding DNA caseload, operates almost entirely outside of state and federal legislation, like its counterparts across the country.

Even the state-of-the-art FBI crime lab in Quantico, Va., was shaken by scandal recently when a DNA analyst, Jacqueline Blake, was caught falsifying her lab reports over a two-year period. Blake skipped an important step in her DNA tests, then lied about it.

A Justice Department report two months ago said the FBI lab's testing procedures needed tightening and criticized officials for dragging their heels on retesting Blake's cases and notifying affected defendants.

Congress tried to address the gap in government oversight of crime labs a decade ago by asking the FBI to set up DNA guidelines that crime labs must follow to get federal funding and use the national DNA criminal databank.

Yet a private medical lab testing your blood-cholesterol level faces more government scrutiny than forensic scientists handling evidence that could put a defendant on death row.

## Botched tests spur out-of-state exam

The single cotton-tipped swab contained an invisible speck of DNA that would make or break the state's case against a Kirkland school bus driver accused of raping a developmentally disabled student.

What began as a straightforward test would end up in a legal tussle over the credibility of the Marysville crime lab's work.

The evidence landed on the desk of forensic scientist Brian Smelser, a four-year lab employee.

His February 2001 report pointed to suspect Kirby Wayne Lyons, a Lake Washington School District employee, as the major source of DNA. The report, however, failed to explain traces of DNA from a second male, and made no



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mention that Smelser had run the test three times due to problems.

Smelser had also told the prosecutor he'd used less of the sample than had actually been consumed, something the defense interpreted as a cover-up but which Smelser said was a simple error.

It was only after Lyons' attorney raised questions that the truth came out: Smelser had contaminated all three tests with his own DNA.

"Mr. Smelser's sloppy reporting techniques and concealment of botched tests cast further doubt on whether any test he performed in this case is reliable," wrote defense attorney Jeff Cohen in a pre-trial motion seeking to exclude Smelser as an expert witness.

Smelser said he would never deliberately withhold information about his work. "There is nothing worth losing my job or reputation over -- no mistake," he said yesterday.

The defense also attacked Smelser's credentials, saying studies for his bachelor's degree in biology hadn't included a biochemistry course, a minimum requirement for crime lab DNA work. When the lab asked Smelser to take a makeup course, he skipped the lab work, according to Cohen. Crime lab officials said they waived the lab time because it was too basic.

To salvage their case, prosecutors persuaded a judge to let them send what was left of the sample to a private lab in Richmond, Calif., to be retested even though usual procedure was to hand it over to defense counsel. The DNA evidence was crucial because the victim, a young woman with an IQ of 40, would not be able to testify.

"I didn't want a cross-claim at trial that there was another person out there who might have contributed it (DNA)," said King County Deputy Prosecutor Jim Rogers.

At a cost of \$5,035, the private lab, run by renowned forensic scientist Ed Blake, matched the DNA to Lyons, and confirmed Smelser had contaminated the first tests.

"That case started out as a total unmitigated disaster," said Blake in a telephone interview. He was particularly concerned that Smelser had failed to disclose his mistakes in his report, something Blake insists on at his lab.

Lyons, then 50, pleaded guilty to a reduced charge of third-degree rape in June 2002 and was sentenced to a year in jail. He was originally charged with second-degree rape. The lab's mishandling of the evidence likely played a "significant role" in the prosecutor's decision to reduce the charges, Cohen said.

Rogers disagreed, saying that the plea was offered because the victim wasn't able to testify. Smelser's mistake, while "unfortunate," didn't affect the outcome of the case or undermine his confidence in the lab's work, Rogers said.

"There was no systemic problem in that," Rogers said. "The quality of the crime lab work has gone up tremendously. They have great scientists there."

The crime labs' forensic scientists are now required to disclose errors in their DNA-testing reports, according to Shutler, a Canadian forensic expert hired two years ago to oversee the state system's two dozen DNA analysts. He made that change about six months ago.

"The old standard was, 'Something minor happened and I won't mention it,' " said Shutler. "I'm trying to change that attitude now."

Shutler also defended Smelser, saying aggressive defense attorneys will seize upon anything to help a client.

"It's an adversarial system," Shutler said. "The forensic scientist is often caught in the middle."

## Slightest contamination detected

In the late '80s to mid-'90s, the early days of DNA "fingerprinting," it was a lot harder for forensic scientists to contaminate the tests.

A decade ago, DNA tests needed a quarter-size stain of blood or semen to produce a strong match and took about six weeks to complete. Today, the lab needs only about 40 human cells, invisible to the naked eye, to produce a DNA

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profile using an extremely sensitive method called "polymerase chain-reaction," or PCR.

With PCR tests, DNA is extracted from a sample, mixed with special chemicals and put into computerized machines that make thousands of copies of the DNA. The process takes days instead of weeks.

The type of PCR test now in use, called "short tandem repeats," or STR, measures DNA at 13 sites, and feeds results to a computer. STR tests can predict a DNA match that has only a one in a quadrillion -- a million billion -- chance of being the same as a randomly selected person.

But the sensitivity of the test also means it detects even the slightest contamination.

In January, the Seattle lab's DNA supervisor, George Chan, was chatting with a forensic scientist who was examining evidence in a child rape case. Although Chan had no other exposure to the case, a subsequent test found Chan's DNA, as well as that of the suspect, in the evidence -- a sample taken from a pair of boxer shorts. The likely culprit: saliva spewed during Chan's conversation.

DNA analysts are now required to use a Plexiglas screen, wear a mask or refrain from talking while testing DNA, Shuttler said.

The lab system has been tightening up all its procedures to reduce contamination, from training staff on sterile procedures to tracking the incidents. The DNA profiles of forensic scientists are also kept on file to compare with suspicious results. Police officers who collect evidence at crime scenes could soon be asked to do the same.

"The challenge is to contain it, identify it and disclose it," Shuttler said of the risk of contamination.

The occasional "contamination event" is inevitable, said Blake, the California scientist, but crime labs aren't routinely disclosing those miscues.

"We have a duty to tell people about that," he said.

Many crime labs are "stunningly ignorant: about contamination, said Janine Arvizu, an Albuquerque-based forensic scientist who has audited federal and private industry labs.

"I wish they'd step up and say, 'We need help cleaning it up,' " Arvizu said. "But they won't. It's pretty scary."

The number of incidents at the State Patrol labs, she said, indicates a "significant contamination problem."

## 'Royal road to a false conviction'

When the mystery man's DNA showed up in evidence from the Pacific child-rape case, Detective James Pickett was mystified.

"That was a pretty big deal," he said. "We did a lot of work trying to figure out who this other guy was."

Perplexed, Pickett pushed to have the evidence retested, but the explanation came too late.

Today, he believes what happened two years ago was an aberration. "The lab does a lot of great work," he said, "(but) they are still human."

Rogers, the King County prosecutor who handled the case, called the DNA mix-up "an issue for the case," but said the No. 1 reason behind the plea bargain was to spare the victim from testifying.

The defendant, who had a previous child molestation conviction, ended up with a 16-year prison term. The P-I is not identifying him in order to protect the victim's privacy.



 Dan DeLong / P-I

Forensic scientist Mike Croteau does preliminary tests for semen on a piece of clothing -- evidence in a rape case -- in the State Patrol's Marysville crime lab. Croteau is testing for acid phosphatase, which is present in high levels in semen.

The forensic scientist, Dornan, was temporarily taken off casework after the mistake was discovered, a crime lab report indicated. Dornan refused to comment on the case.

The contamination was traced to Dornan failing to sterilize scissors between cutting evidence samples in the two cases. After that problem came to light, lab officials adopted more stringent sterilization procedures.



Dornan

Since then, at least two more incidents of cross-contamination between cases have occurred -- one in 2003, and one this year, records show. Both mistakes were caught before a report was issued because the contamination showed up in control samples that are not supposed to contain any DNA, lab officials said.

Contamination in control samples is the easiest type to catch and can point to more widespread problems, said Thompson, the criminology professor.

"Who can believe the only contamination they have is those (cases) where they can detect it? There's inevitably lots more," Thompson said.

That contention was recently confirmed by a study in the May 2004 Journal of Forensic Sciences that found that clean controls don't guarantee contaminant-free evidence.

If DNA from a suspect's reference sample contaminated evidence, there'd be little chance of detecting it, Thompson said.

"That's the royal road to a false conviction."

## Police nearly extradite wrong person

Crime lab forensic scientist Denise Olson called Seattle police with good news in December 2002. Her DNA testing revealed a match to the suspect in a case involving a brutal rape and attempted murder. The victim suffered a fractured skull, lacerated liver and other injuries.

Detectives contacted a deputy prosecutor, who prepared to file charges against a former boyfriend of the military doctor attacked in the May 2002 assault. Police got ready to extradite the suspect from Denver.

Eleven days after declaring the match, Olson called back.

The test had actually ruled out the suspect. She'd misinterpreted the results, and so had a colleague who did a quick check. Another forensic scientist noticed the error during peer-review, a process in which workers double-check each other's work.



Olson

"I frankly had a brain fart," Olson said in a recent interview.

Her mistake was a "false-positive match" -- one of the worst mistakes a forensic scientist can make, said Arvizu, the auditor. "That's a classic error that reflects a bias on the part of the analyst wanting to make a match."

Olson, who has worked in the crime lab system since 1998, said she tried not to be swayed by detectives' belief that they had a strong suspect. "We're all human," she said. "I tried not to let it influence me. But I can't say it never does."

Records show she didn't keep notes on her calls to police, as required. She also threw out the erroneous draft report, a violation of lab policy.

Police called lab officials to complain in January 2003.

An investigation concluded that Olson had misread the test, which contained a mixture of DNA from at least two people -- a complex sample that requires careful interpretation. She missed indications in the DNA that excluded the suspect.

The lab's internal review said Olson rushed her work in order to satisfy police.

"The quality of interpretations and data review should not be compromised

under pressure from the submitting agencies to prematurely release results," the internal crime lab report said.

Lab officials later issued a systemwide memo stating that cases must be reviewed by a colleague and approved by a supervisor before DNA results are released verbally.

It wasn't the first time Olson's DNA work had been criticized. Twice in the previous six months, she made mistakes, running samples in the wrong order in a robbery case and throwing out evidence swabs in a homicide.

"It was a particularly stressful time," Olson said, adding that she transferred from the Seattle to Spokane lab during that period. She had to take a backlog of six cases with her from Seattle that weren't finished.

Keeping up with the explosive demand for DNA testing is a challenge for the labs.

DNA now has the potential to help solve everything from decades-old homicides to break-ins. Even auto thefts could be solved with DNA, although the lab has to give priority to major cases right now.

Requests for genetic testing were up 60 percent in the first three months of this year compared with the same period in 2003 -- up from 305 requests to 502. The lab system has been able to cope with the increase because several staff recently finished DNA training. And six new DNA positions are proposed in next year's budget.

Right now, at least one-third of the DNA analysts are inexperienced.

Said Shutler: "They're under a hell of a lot of pressure to get it out as fast as possible and do it perfectly."

## **Crime lab passes 'DNA audits'**

A decade ago, Congress took a stab at reform by passing the DNA Identification Act, requiring the FBI to set up a DNA advisory board to develop crime lab standards.

The law also provided funding to improve the quality of forensic labs, and money for the FBI to expand its Combined DNA Index System, or CODIS. The databank contains genetic profiles of convicted offenders and DNA from unsolved crimes.

Labs must meet the FBI's DNA standards to qualify for federal funding and have access to the national DNA databank. That is an incentive for financially strapped crime labs, including Washington's system.

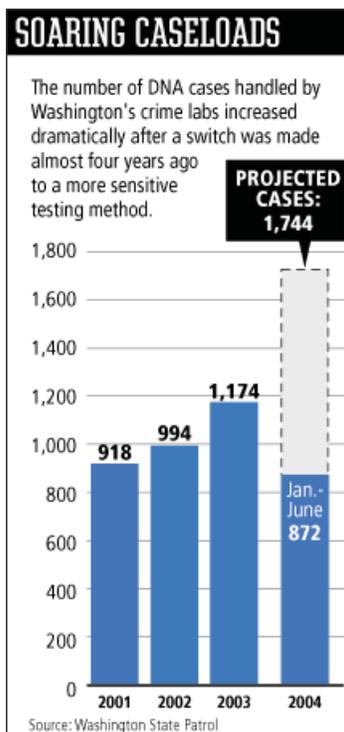
In 2000, the State Patrol received \$2.1 million to hire a private lab to help clear a backlog of 30,000 DNA samples from convicted felons that had not been analyzed or entered into CODIS. An additional \$1.8 million grant in 2003 is paying for 56,000 more felon samples. The lab has also received federal grants totaling almost \$1.5 million since 2000 to upgrade lab equipment.

To satisfy FBI standards, the State Patrol must submit to an external "DNA audit" once every two years. The lab contracts with officials from other state crime labs to do the audit.

A review of three of those audits since 1997 indicated that the State Patrol labs passed most items on the checklist with flying colors.

"We're audited all over the place," Logan said. "If we had any systemic problems I guess they'd come to light in the process."

The 1999 audit did note that several DNA



analysts needed to verify they'd taken biochemistry courses, while the 2000 audit suggested staff needed better training in interpreting complex DNA mixtures.

The 2002 audit was done by the National Forensic Science Technology Center, a federally funded organization originally set up by the American Society of Crime Laboratory Directors. That group hires DNA experts from public and private labs to do the audits.

The most serious problems cited during the 2002 audit were at the Spokane lab, where the inspector warned the "risk of contamination is high" because of crowding in the basement facility. A new lab is under construction.

The audit did not mention mistakes or contamination requiring "corrective action" at any of the labs, raising questions about the thoroughness of the reviews. The Marysville lab reported having no problems when records show there were at least two flawed cases in the previous year.

"It almost makes you think the whole thing is a rubber stamp," said Thompson, the criminology professor.

But Mark Nelson, who runs the audit program for the national forensic center, said auditors pull sample cases to make sure problems are corrected. "We are very thorough," he said.

A backlog of audit reports at the FBI meant the lab didn't receive proof it passed the 2002 review until three months ago.

## 'Nobody watching the henhouse'

Crime lab officials say the ultimate test of their work is what happens in court.

DNA results are examined by defense experts who review lab notes, analyze computer data and rerun tests to double-check accuracy. Experts also observe DNA testing at the lab when a sample is too small to divide.

Yet critics say many defense attorneys are easily intimidated by DNA cases and don't dig deeper when a suspect has been "matched" to a crime. Instead, they cut the best deal they can.

That means only a small percentage of cases are ever reviewed by defense experts, said Dan Krane, a biology professor at Wright State University in Ohio, who runs a private forensic consulting company.

"There's nobody watching the henhouse," Krane said.

Underlying this divide in the forensic community are divergent views about the

role state-run crime labs play in the criminal justice system.

Crime lab employees say they are objective scientists doing their best to uncover the truth -- not biased members of the prosecution team. "We don't see ourselves that way," said Logan, adding that one-third of their testing excludes suspects. "We have no interest in seeing the wrong person in jail for a crime."

That doesn't reassure critics, who say crime labs are primarily set up to service police and prosecutors. "That goal comes to cloud their need for scientific rigor," said Thompson, the criminology professor.

Society deserves more assurances that justice will be served when crime labs wield the powerful tool of DNA testing, he said.

"Innocent people aren't that common," Thompson said. "The question is, do they have the ability to detect when an innocent person comes along?"

## TOMORROW

The crime lab system's credibility has been undermined by problem employees and lax oversight.

- See the P-I's previous crime lab investigation, [Shadow of Doubt](#).

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