



## Handheld Raman Analysis Cuts Through Clutter in Labs—and in Court

When law enforcement seeks to bring a court case against drug traffickers, there is a set of legal guidelines that must be followed. A key aspect of these legal demands involves evidence: to be admitted in a court of law, any evidence must be acquired, stored, and transmitted in a manner that is deemed trustworthy and accepted by the judiciary. For over a decade, Thermo Scientific™ TruNarc™ Handheld Raman Analyzers have been successfully relied upon as presumptive tests in the field and during preliminary hearings, with every challenge to their findings consistently upheld by confirmatory laboratory results. A recent courtroom ruling in a case brought by the San Diego District Attorney's office demonstrated how the trustworthiness of Raman spectroscopy, and specifically TruNarc analyzers, as implemented by California public safety officers and the San Diego D.A.'s office, increases the chances of drug cases being settled while alleviating the work load of forensics laboratories.

### Introduction

In early 2024, a narcotics case in California's Fourth District (*People v. Rios*, case G061764) challenged the admissibility of evidence from a TruNarc handheld Raman analyzer. The issue was whether the TruNarc constituted a "new scientific technique" under California's *Kelly* rule. At a pretrial hearing, the testifying officer admitted he didn't know "the exact science behind it." The appellate judge noted, "In our research, we found no California opinions establishing the reliability of the TruNarc identification device." Consequently, evidence from TruNarc was excluded for not meeting *Kelly* standards.

The ruling sparked concern in the San Diego D.A.'s office. If TruNarc evidence was inadmissible, many drug cases might collapse or require verification from forensic labs. As James Fontaine, head of the D.A. office's major narcotics division, explained: "If you have a ruling that says this is not generally accepted, how can we stand in front of a court and say, 'No, this is competent evidence?'" Courts began excluding TruNarc evidence, and some charges were dismissed.

Since TruNarc analyzers had been widely used in San Diego, the D.A.'s office faced pressure to legitimize the devices' results. Relying on state labs was not a viable option; California's average turnaround for controlled substance testing is 14.4 days, and other states can face delays of a month or more. To keep cases moving, the D.A.'s office sought a way to validate TruNarc evidence.

In a 2025 San Diego case, they brought TruNarc evidence—and expert testimony—to the pretrial hearing.

## Challenges

Courts deal in facts and evidence, not hunches. When an officer brings a narcotics-related case, they can't just make an educated guess about the substances involved. "Our default tends to be, get a presumptive on the drugs when you submit it to us for purposes of issue," said Fontaine. "That gives us much more confidence in knowing what drug we're dealing with, and that will define what statute we are then charging against the defendant. That's why it's so important for us to get it right, straight out of the gate."

Using county forensics labs for presumptive narcotics identification poses challenges—they're overloaded with testing samples such as blood samples, fingerprints, clothing fibers, and trace evidence, and they are under-resourced. "With those limited resources, you have to prioritize limited number of bodies, right?" Fontaine explained. Finding a way to bring trustworthy evidence to trial without burdening the labs was essential.

To support TruNarc's admissibility, Fontaine's team researched whether its science was established rather than "new." Assistant Chief Jorge Del Portillo led the effort, consulting academic and industry experts, including Thermo Fisher Scientific scientist Matt Gabel. "That was the fascinating part of working with Thermo Fisher," Fontaine said. "[Jorge] was talking about in the 1920s how it's being used, and then forensically for decades. But for us it's new and novel. That's the default until we show otherwise."

## Solution

When the San Diego case reached the pretrial hearing, the district attorneys were well-prepared. They brought all the key facts, strong supporting evidence, and a raft of expert witnesses.

They began by clearly telling the judge how they planned to introduce presumptive evidence from the TruNarc analyzer. Fontaine explained the way they presented their case to the court: "We filed our motion and said, 'Judge, we're planning to admit this evidence from a TruNarc device at the preliminary examination. It's a presumptive drug testing device. There is an appellate decision out of Orange County called *People v. Rios* that has found it to be novel, new and not generally accepted in the scientific community. We want you to make a different finding and we're going to put on the experts to convince you that you should.'"

Fontaine's team then proceeded to do just that. Several experts testified about the well-established scientific principles behind the TruNarc.

"There was a Florida International University professor who had done some independent validation of results from the TruNarc device," noted Fontaine. "Our San Diego County sheriff's office also had done their own validation studies, and so they had people that work in their crime lab who also served as experts. They all testified in this hearing."

Matt Gabel, application scientist for Raman products at Thermo Fisher, was another expert who took the stand. "We were establishing largely the history of Raman spectroscopy as an established technique, along with the plethora of cited literature articles using Raman spectroscopy," Gabel recalled. "Raman's a very established analytical technique, theoretically and practically. It was discovered in the early 1900s and then heavily implemented across industries in a wide range of fields since the 1970s. Really, it is very commonplace in a lot of analytical facilities, especially in forensic spaces."





## A brief background on Raman analysis and the TruNarc analyzer

The features of the Thermo Scientific™ TruNarc™ Handheld Narcotics Analyzer are based on decades of scientific precedent. The first Raman spectrometers were developed in the 1930s. The first working laser was constructed in 1960. The advancements in the past decades that have made the TruNarc handheld Raman analyzer possible come mainly in the form of miniaturization and software advances. The fundamental concepts behind Raman spectroscopic analysis remain the same in today's handheld analyzers as they were a century ago.

Raman spectroscopy uses a light source—nowadays, a laser—to irradiate a sample, causing most light to scatter at the same wavelength (Rayleigh scattering) and a small fraction at different wavelengths (Raman scattering) due to molecular vibrations. These wavelength shifts create a unique spectral “fingerprint” that reveals the sample's molecular structure and composition. A detector registers and records the signals from the scattered light, which can then be evaluated. By analyzing the Raman spectrum, scientists can identify and characterize a sample's chemical properties. No two molecules give exactly the same Raman spectrum, and the intensity of the scattered light is proportional to the amount of material present. Thus Raman provides both qualitative and quantitative information about the sample. It is this type of spectral information that allows TruNarc analyzers to determine not just what substances are present, but their relative amounts. The custom software can process these signals and, with its onboard library, identify the highest priority illicit and abused narcotics in a single drug test.

Because Raman technology is non-destructive and non-contact, analyzers can scan directly through sealed glass and plastic containers. This feature helps ensure officer safety by reducing exposure and is particularly useful for preserving evidence. And because the scientific principles are well established, law enforcement and the judiciary can have confidence that any analytical results are trustworthy.

Gabel was able to place the TruNarc analyzer within the broader context of recognized analytical chemistry methods. “There's excellent response to most materials through a Raman analysis technique and a device like the TruNarc. And with that it becomes a very comparable technique to other well-established techniques such as FTIR spectroscopy and mass spectrometry. All of that puts Raman onto an even playing field with these other established analytical techniques.”

In the end, the court agreed with the scientific experts. Fontaine took it from there: “At the conclusion of the preliminary examination, we got transcripts of the hearing, and we also asked the court for a written order finding that the TruNarc device relied on generally accepted science within the community, that it followed generally accepted principles, that it was reliable, that it was admissible. And we got that order.”

Going forward, in any narcotics case that uses a TruNarc analyzer to develop presumptive evidence, the prosecuting attorney will still need to show that the device was used properly by the investigating officer. But that's much easier than having to demonstrate that the science itself is valid. Now that the affirmation exists that evidence from a TruNarc analyzer is admissible for preliminary hearings, the prosecutors can keep submitting TruNarc-based evidence at the outset of cases. If somebody does eventually challenge the evidence and file an appeal, the appellate court could then publish a binding ruling that would affirm its legal validity.



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## Conclusions

This San Diego case demonstrated, through expert testimony and confirmatory evidence, that the scientific principles and technology behind the TruNarc Handheld Narcotics Analyzer are not new, novel, or unreliable. The science has been in use for decades across many fields and is widely considered dependable. As a result of the hearing, the San Diego District Attorney's Office secured judicial approval for using TruNarc analyzers to provide presumptive evidence.

Regular use of TruNarc analyzers is expected to help resolve more cases without going to trial, reducing the burden on forensic labs to conduct in-depth confirmatory tests for court proceedings. This means more cases can be resolved efficiently, and more dangerous narcotics can be removed from the streets.

Summarizing the stance of the San Diego D.A.'s Office—and of district attorneys across the state—Fontaine stated, "Now we're sitting in a much more comfortable place, where we are confidently relying on TruNarc as supporting evidence at the preliminary examination stage, and we're pushing our cases forward. All that hesitancy, that people weren't submitting cases, that judges were dismissing... that has ended for us because of the hearing that we conducted. So that's a huge win right now, whether or not we ever get an appeal."