

IN THE COUNTY COURT OF CHEYENNE COUNTY, NEBRASKA

STATE OF NEBRASKA,)
Plaintiff,)
vs.)
CORY A. LUNDGREN,)
Defendant.)

Case No. CR10-426

ORDER

FILED

MAR 14 2011

COPY

CHEYENNE COUNTY COURT

NOW ON THIS 2nd day of March 2011 this case comes before the court in

chambers for ruling on the defendant's Motion Pursuant to Evidence Rule § 27-104

Concerning the Testimony of Expert Witnesses. The hearing on the motion was held on the 1st day of February 2011. At the conclusion of the hearing, the parties requested an opportunity to submit briefs. The court has since had an opportunity to review the briefs submitted by both parties.

The defendant argues that the expert opinion testimony to be given by Madeline Montgomery, Supervisory Forensic Chemist Examiner/Forensic Toxicologist for the Federal Bureau of Investigation (FBI), fails to meet the foundational standard adopted in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, (1993) and *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001). In short, the defendant claims Ms. Montgomery's expert opinions are not reliable.

In addressing this issue, the court takes a two-prong analysis to determine whether Ms. Montgomery's expert opinions should be allowed. First, does Ms. Montgomery's knowledge, skill, experience, training, and education qualify her as an expert? *Id.* at 386. Second, is the reasoning or methodology underlying Ms. Montgomery's opinions scientifically valid? In answering this second prong of the test:

[s]everal nonexclusive factors are considered in making the determination:
(1) whether a theory or technique can be (and has been) tested; (2) whether



it has been subjected to peer review and publication; (3) whether, in respect to a particular technique, there is a high known or potential rate of error; (4) whether there are standards controlling the technique's operation; and (5) whether the theory or technique enjoys general acceptance within a relevant scientific community." *State v. Casillas*, 279 Neb. 820, 835, 782 N.W.2d 882 (Neb. 2010).

As pointed out above, the first inquiry addresses Ms. Montgomery's knowledge, skill, experience, training, and education to qualify her as an expert. Exhibit 1 is Ms. Montgomery's curriculum vitae. Ms. Montgomery obtained her Bachelor's of Science degree in chemistry from George Washington University in 1996.

Immediately following graduation, Ms. Montgomery became employed as a Forensic Chemist with the FBI at its laboratory in Washington, DC. The duties of this position involved the examination of evidence submitted to the FBI Chemistry Unit in criminal investigations. Specific areas of examination included *toxicology, drug and drug residue cases*, analysis of bank security dye residues, *and identification of unknown chemicals*. (Own emphasis added).

While maintaining her employment with the FBI as a Forensic Chemist, Ms. Montgomery then continued her education with graduate coursework in forensic science and forensic toxicology at George Washington University from 1998 – 2002.

In January 2001, Ms. Montgomery was promoted from Forensic Chemist to Forensic Chemist Examiner/Forensic Toxicologist. The duties of this position involved the examination of evidence submitted to the FBI Chemistry Unit in criminal investigations in the area of toxicology and chemical identification. Specific areas of responsibility included inventorying evidence, *using chemical extraction principles to isolate drugs and poisons from biological samples* and food matrices, *analyzing prepared extracts using analytical instrumentations, interpreting results of analyses, and providing*

results and interpretations in the form of written reports and oral testimony. (Own emphasis added).

In August 2006, Ms. Montgomery was promoted to Supervisory Forensic Chemist/Forensic Toxicologist, a position that she currently maintains at the FBI Laboratory. In addition to her prior duties without the supervisory title, the additional duties of this supervisory position involve managing the personnel assigned to the Toxicology Subunit of the Chemistry Unit of the FBI Laboratory, *reviewing and issuing new and revised standard operating procedures within the Subunit; ensuring that the Toxicology Subunit is operating within all applicable quality assurance and quality control guidelines; and advising field agents and local law enforcement personnel of the feasibility of requested toxicological examinations and capabilities of the Toxicology Unit.* (Own emphasis added). Ms. Montgomery testified there are 20 employees in the FBI Laboratory Chemistry Unit, and Ms. Montgomery supervises 6 toxicologists in her current position. Furthermore, Ms. Montgomery is the only employee in the unit that is cross-trained as both a forensic chemist and forensic toxicologist.

In addition to her work in the FBI Laboratory and education at George Washington University, Ms. Montgomery's curriculum vitae shows she has attended numerous work-related professional trainings between 1996 and 2010; is a longstanding member of the Society of Forensic Toxicologists (SOFT), The International Association of Forensic Toxicologists (TIAFT), and several other professional work-related organizations; and has had numerous work-related articles published during her career with the FBI. Ms. Montgomery also testified that she has previously testified as an expert forensic chemist in both state and federal courts.

The defendant takes great issue with this case involving the first and only opportunity for Ms. Montgomery, and the FBI Laboratory where she is employed, to test for a synthetic cannabinoid from a sample provided in a criminal investigation. Ms. Montgomery testified that synthetic cannabinoids are artificially made and not found in nature. In its pure form, a synthetic cannabinoid is a liquid, and it is then dried onto a plant material.

Synthetic cannabinoids first came to Ms. Montgomery's attention about one year ago at a conference she attended with her superior in Switzerland. In an effort to stay ahead of the curve, so to speak, Ms. Montgomery returned from Switzerland and began preparing the FBI Laboratory where she works for testing synthetic cannabinoids based on the growing use of synthetic cannabinoids in the United States and pending legislation to ban synthetic cannabinoids in the United States.

In developing the FBI Laboratory's procedures for analyzing synthetic cannabinoids, Ms. Montgomery has obtained 19 standards, or known samples, from chemical companies. When possible, the standards, or known samples, are obtained from ISO suppliers—chemical companies that are accredited by an international accrediting body.

Exhibit 4 is a power point presentation regarding Ms. Montgomery's synthetic cannabinoid analysis developed and utilized at the FBI Laboratory. Drug analysis in general involves a screening and confirmation to determine the test's reliability. Further, two individual samplings are completed to eliminate the possibility of mixing up samples. These are all general SWGDRUG guidelines adopted by the FBI Laboratory.

Again, in general, to identify a specific compound, the analytical data produced from an unknown sample is compared to that of a known standard, or known sample. Multiple points of comparison are used for confirmation. More specifically, three points of comparison: retention time, molecular weight, and fragmentation pattern or chemical fingerprint are used for confirmation.

Retention time is obtained through the use of chromatography. This can either be gas chromatography (GC) or liquid chromatography (LC). Chromatography has been used in all fields of forensic chemistry for decades as the first point of comparison in analyzing a sample. However, chromatography is limited in its analysis because some chemicals will have the same retention time.

Because of this limitation, mass spectrometry is used to identify the molecular weight of a sample. The molecular weight of a substance is the sum of the atoms obtained from the periodic table. Mass spectrometry has been commonly used in forensic chemistry for over 30 years as a means of identifying a substance and provides the second point of comparison for a sample. However, similar to chromatography, mass spectrometry is limited in its analysis because some chemicals have the same molecular weight.

High resolution mass spectrometry provides a more accurate or exact mass weight. More specifically, Ms. Montgomery testified that high resolution mass spectrometry provides a weight of up to the nearest ten thousandth, or four places past the decimal point. High resolution mass spectrometry does require specialized instrumentation, which the FBI Laboratory has available. However, because of the

specialized instrumentation, high resolution mass spectrometry is not as common in forensics as traditional mass spectrometry.

Mass spectrometry fragmentation, or the chemical fingerprint, is the third point of comparison to further assist in properly identifying a sample. Mass spectrometry fragmentation involves breaking molecules into fragments to gain structural information and has been used in forensics for decades.

In developing the FBI Laboratory's methodology and protocols to analyze synthetic marijuana, Ms. Montgomery incorporated the above-referenced three points of comparison generally accepted in the scientific and forensic community. The initial screening is accomplished by using direct analysis in real time time-of-flight mass spectrometry (DART TOF MS). This screening method is also commonly used in the FBI Laboratory for the drug screening of pills, liquids, powders, and plant material.

Confirmation is then performed by liquid chromatography, mass spectrometry, and high resolution mass spectrometry to obtain three points of comparison. These three methods are validated for the 19 known synthetic cannabinoid compounds that are available as standards from chemical companies. These three methods are also similar to those in published, peer reviewed journal articles.

Ms. Montgomery testified that liquid chromatography was used, rather than gas chromatography, because liquid chromatography can separate compounds with the same molecular weight. Further, the high resolution mass spectrometry was used to obtain the advantage of a more accurate or exact mass to the nearest ten thousandth.

Ms. Montgomery admitted that using the FBI Laboratory's current parameters to analyze synthetic marijuana, there is no way to differentiate between two of the 19

standards, HU-120 and HU-211. In addition, without a standard for comparison, the reaction time and fragmentation pattern are unknown. However, to validate the analysis in this case, interference studies were conducted using marijuana, tobacco, and 10 common spices.

Ms. Montgomery's analysis of the two samples provided and tested in this case revealed each was synthetic marijuana identified as JWH-018. Further, there are no other possibilities for the results obtained in this case. Moreover, the testing techniques utilized in this case are not new or novel and are used every day on other substances, and the FBI Laboratory is ISO accredited.

Ms. Montgomery also testified that her findings in this case were subjected to peer review by another qualified forensic examiner in the FBI Laboratory. More specifically, the peer review was conducted by Dr. Jason Brewer, Ph.D. Analytical Chemistry. Dr. Brewer has been employed by the FBI for about five years. Upon receiving and reviewing the data and conclusions reached by Ms. Montgomery in her initial report, Dr. Brewer agreed with Ms. Montgomery's findings.

Ms. Montgomery also offered an opinion on the affects of synthetic cannabinoids on the human body. Ms. Montgomery testified that synthetic cannabinoids can cause red eyes, mood elevation or euphoria, paranoia, hallucination, impaired sense of time, and sight and sound issues. This opinion is based on her education, training, article reviews, and work experience in chemistry and toxicology to a reasonable degree of scientific and forensic certainty.

Turning back to the first prong of the *Daubert/Schafersman* test, this court finds that Ms. Montgomery's knowledge, skill, experience, training, and education qualify her

as an expert. Ms. Montgomery has a bachelor's degree in chemistry; has completed graduate coursework in forensic science and forensic toxicology; has been employed at the FBI Laboratory as a forensic chemist and forensic toxicologist since 1996 and held a supervisory position since 2006; and has previously testified as an expert forensic chemist in both state and federal courts.

Turning now to the second prong of the test, there are several nonexclusive factors to be considered in determining whether the reasoning or methodology underlying Ms. Montgomery's opinions are scientifically valid.

First, this court finds that Ms. Montgomery's theory or technique can be, and has been tested. Ms. Montgomery used the existing protocols in place at the FBI Laboratory to develop the FBI Laboratory's protocols and procedures for testing synthetic cannabinoids. By using 19 standards, or known samples, as comparison, Ms. Montgomery was able to determine that the samples provided in this particular case can only be the synthetic cannabinoid identified as JWH-018. The testing procedures utilized are generally accepted in the scientific and forensic community.

Second, Ms. Montgomery's testing of the samples provided herein has been subjected to peer review by Dr. Brewer, Ph.D., who came to the same conclusion. Although this was an in-house peer review by the FBI Laboratory, the methods used to obtain the conclusion reached by Ms. Montgomery have long been generally accepted and used in the scientific and forensic community.

Third, Ms. Montgomery testified there is no rate of error with her conclusion because the result she obtained is the only result that could be obtained. No evidence to the contrary was provided.


Fourth, Ms. Montgomery utilized 19 known standards for comparison. These known standards were obtained from ISO certified chemical companies when possible. In this particular case, the JWH-018 standard was obtained from an ISO certified chemical company.

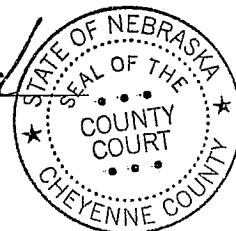
Fifth, as pointed out above, the theory or technique utilized by Ms. Montgomery enjoys general acceptance with the relevant scientific community. Although testing for synthetic cannabinoids is a very recent development, the theory or technique developed by Ms. Montgomery and the FBI Laboratory to do so is not.

Based on the above, this court finds that the proffered testimony of Madeline Montgomery meets the *Daubert/Schafersman* standards and is permitted at trial.

IT IS SO ORDERED.

BY THE COURT:


Randin R. Roland
County Judge



CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the 14th day of March, 2011, a true and correct copy of this order was served upon the following by first-class mail, postage prepaid:

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