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IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SECOND APPELLATE DISTRICT

DIVISION FIVE

THE PEOPLE,

Plaintiff and Respondent,

v.

TRAVION A. McCRAW,

Defendant and Appellant.

B154790

(Los Angeles County
Super. Ct. No. TA102096)

APPEAL from a judgment of the Superior Court of Los Angeles County. Gary R. Hahn, Judge. Affirmed with modifications.

Ralph H. Goldsen, under appointment by the Court of Appeal, for Defendant and Appellant.

Bill Lockyer, Attorney General, Robert R. Anderson, Chief Assistant Attorney General, Pamela C. Hamanaka, Senior Assistant Attorney General, Deborah J. Chuang and Alene M. Games, Deputy Attorneys General, for Plaintiff and Respondent.

I. INTRODUCTION

Defendant Travion Aaron McCraw appeals from his convictions for two counts of attempted first degree residential robbery in concert (Pen. Code,¹ §§ 211, 664) and first degree murder. (§ 187, subd. (a).) The jury also found that the murder was committed while defendant was engaged in the commission of the attempted residential robbery in concert with others. (§ 190.2, subd. (a)(17).) Defendant argues the trial court improperly admitted testimony regarding mixed forensic samples and genetic profiling and there was insufficient evidence to support the special circumstance finding. The Attorney General argues the abstract of judgment must be modified. We reject defendant's contentions and accept that of the Attorney General.

II. FACTUAL BACKGROUND

We view the evidence in a light most favorable to the judgment. (*Jackson v. Virginia* (1979) 443 U.S. 307, 319; *People v. Osband* (1996) 13 Cal.4th 622, 690; *Taylor v. Stainer* (9th Cir. 1994) 31 F.3d 907, 908-909.) At approximately 1 p.m. on November 1, 1999, Cynthia Tresvant spoke with her neighbor, Alex Mathis. Ms. Tresvant spoke to Mr. Mathis and his employer earlier outside her apartment. Later, Ms. Tresvant saw six men walk around Mr. Mathis's home. Ms. Tresvant walked across the street. Ms. Tresvant asked, "Ya'll looking for [Mr. Mathis]?" Defendant was one of the six men. Defendant responded, "Who is he?" Ms. Tresvant became suspicious and returned to her apartment. The six individuals congregated around a white automobile, where other men joined them. Ms. Tresvant attempted to locate Mr. Mathis's phone number in order to warn him about the men. Mr. Mathis's employer drove away. Mr. Mathis then began working in his garden.

¹ All further statutory references are to the Penal Code unless otherwise indicated.

The six men, including defendant, ran toward Mr. Mathis. The men began beating Mr. Mathis. The men were beating Mr. Mathis with their hands and feet. They also used a shovel and a table. Ms. Tresvant called the police. As Ms. Tresvant was speaking to the operator, she heard one of the men say, "Blast now." Ms. Tresvant heard a gunshot. The operator said: "Man down. Gunshots fired." Before the gunshot, Ms. Tresvant saw a Mexican man, Jose Bustamante, run to help Mr. Mathis. However, Mr. Bustamante retreated when the men began attacking him as well. After Mr. Mathis was shot, his assailants fled. Ms. Tresvant saw the white car and a brown automobile driving past her apartment. Ms. Tresvant ran across to Mr. Mathis's apartment. Mr. Mathis was lying on the floor, bleeding heavily. Ms. Tresvant was uncertain if defendant was holding the gun when she saw him with Mr. Mathis's assailants. However, she was certain that defendant was involved in the beating.

Tina Lottie was Mr. Mathis's fiancée. Ms. Lottie and her two daughters lived with Mr. Mathis on November 1, 1999. Mr. Mathis worked for James Harris in a construction and landscaping business. Mr. Bustamante lived in the duplex unit behind their house. On November 1, 1999, Ms. Lottie's sisters, Cora and Christine McCaleb² were visiting at her home. Mr. Harris visited Mr. Mathis for 30 to 45 minutes. When Mr. Harris left, Ms. Lottie heard Mr. Mathis call out to her. Ms. Lottie believed it appeared to be a call for help. Ms. Lottie went to look for Mr. Mathis's gun. Then a man came into Ms. Lottie's house, grabbed her, and put a gun to her head. The man asked her where the money could be found. Ms. Lottie told the man they did not have any money. The man asked who else was in the house. Ms. Lottie said her sisters and an infant were in the residence. The man told Ms. Lottie to have them come out or he would kill her. When Ms. Lottie asked her sisters to come out, they came out of the closet where they had hidden. As Christine came out of the bedroom, she saw defendant through the front door.

² For purposes of clarity and not out of any disrespect, the McCaleb sisters will be referred to by their first names.

Defendant was wearing a tank top. Defendant was holding a gun and pointing it down at Mr. Mathis. According to Christine, Mr. Mathis was laying on his back on the ground and there were approximately six men outside the residence. The man inside the house kicked at Christine, who was pregnant. The man ordered Ms. Lottie's sisters to lie on the floor. Mr. Bustamante broke the window to the back door and shot at the man holding Ms. Lottie. The man shot back at Mr. Bustamante and ran out the door. Soon thereafter, Mr. Mathis came into the house. He was bleeding. When Ms. Lottie saw Mr. Mathis, he was not breathing. Mr. Mathis later died as the result of a gunshot wound to his chest.

Compton School Police Department Detective Rudy Johnson was in training with the Compton Police Department on November 1, 1999. Detective Johnson was en route to lunch in an unmarked police car with an individual identified only as Detective Ming. Detective Johnson heard a radio call of "shots fired." The police dispatcher gave a description of a white Monte Carlo automobile. Soon thereafter, Detective Johnson saw a white car followed by a brown and beige automobile. Detective Ming followed the two cars. The white automobile failed to stop at a traffic light and picked up speed after Detective Ming activated the emergency lights. Detective Ming continued to chase the white car for some time. The white car turned and stopped. By the time Detective Ming arrived at the place where the car stopped, the driver was gone and the passenger, an African-American wearing a T-shirt and jeans, was running away. Detective Johnson remained with the Monte Carlo, which had the license number 4BYZ402.

Reverend Donald Watson heard a fast-moving car outside his home. Reverend Watson went to his door, just as a white car stopped. Two Black men in T-shirts jumped out of the car, ran across the street, and jumped a neighbor's fence. One of the men dropped his T-shirt on the fence.

Compton Police Officer Sean Logan heard that two African-American men had fled the white Monte Carlo. While driving in the area, Officer Logan saw defendant walking. Defendant was sweating profusely and breathing heavily. Officer Logan stopped his police car. Defendant then began removing his tank top T-shirt. Officer Logan picked up the T-shirt and returned it to defendant. The T-shirt was damp and had

dirt smudges. Defendant's jeans had brown dirt smudges and green stains on the thighs and knees.

Officer Logan detained defendant, who was subsequently driven back to where the white Monte Carlo was parked. Officer Logan saw Officer Vasquez recover a white T-shirt from a nearby chain link fence at that location. Thereafter, a field identification was conducted. Compton Police Officer Randy Williams drove Christine to the place where defendant had been detained. Following an admonition, Christine positively identified defendant as the individual fighting with Mr. Mathis. Christine also said defendant held a gun to Mr. Mathis's head. Finally, there was evidence defendant had purchased the white Monte Carlo from Jesus Ruiz.

Los Angeles County Sheriff's Department Senior Criminalist Flynn Lamas examined defendant's tank top T-shirt and jeans. Mr. Lamas found: a small stain on defendant's tank top; a red stain on the jeans; and both were positive for human blood. Los Angeles County Sheriff's Department Criminalist Paul Colman conducted a deoxyribonucleic acid analysis on the blood stains on the: tank top; jeans; white T-shirt found on the fence near the white car; as well as, blood samples from Mr. Mathis and defendant. Mr. Colman utilized the Profiler Plus and COfiler kits and polymerase chain reaction techniques to analyze the samples. The analysis of Mr. Mathis's blood reflected some weak alleles in addition to the norm. Mr. Colman explained that this result was due to the fact that Mr. Mathis had received blood transfusions prior to his death. The blood on the white T-shirt matched Mr. Mathis's genetic profile and could not have originated from defendant. The blood on the tank top was consistent with defendant's genetic profile. The blood on defendant's jeans also matched Mr. Mathis's genetic profile.

III. DISCUSSION

A. Admissibility of Deoxyribonucleic Acid Evidence

1. *Kelly* Hearing

Prior to trial in this case, defendant stipulated to follow the findings of a *Kelly* hearing held regarding three unrelated cases for purposes of a discovery motion.³ (*People v. Kelly* (1976) 17 Cal.3d 24, 30-41; see *People v. Roybal* (1998) 19 Cal.4th 481, 505.) Now retired Judge Dino J. Fulgoni presided over a hearing pursuant to Evidence Code section 402 to determine whether deoxyribonucleic acid evidence was admissible pursuant to *Kelly*. The hearing involved 19 days of testimony and argument on whether the mixed source sampling of deoxyribonucleic acid testing had gained general acceptance in its field pursuant to prong one of *Kelly*. Thereafter, Judge Fulgoni reached the conclusion that the evidence was generally accepted in the scientific community. We recently held that mixed sample deoxyribonucleic acid testing was accepted in the scientific community. (*People v. Smith* (2003) 107 Cal.App.4th 676, 671-672.) For purposes of that finding's application here, we will repeat the analysis utilized in *Smith*.

2. *Kelly* Determination

Defendant argues that following an extended hearing, Judge Fulgoni improperly determined that the technology utilized in deoxyribonucleic acid testing for analysis of mixed source samples was *generally accepted in the scientific community*. Defendant

³ The unrelated cases included: *People v. Kenneth Dean Hunt* (Super. Ct. L.A. County, No. SA034500); *People v. Robert Rose* (Super. Ct. L.A. County, No. BA181112); *People v. Desi Arnell Burns* (Super. Ct. L.A. County, No. BA191294); and *People v. Terry Smith* (Super. Ct. L.A. County, No. TA102226).

concedes that it is generally accepted that polymerase chain reaction and short tandem repeats are reliable in identifying the characteristics of genetic material in single source forensic samples. Defendant argues though that the issue is: “[W]hether the results of [polymerase chain reaction and short tandem repeats] testing can be interpreted in a matter that assigns genetic material to specific contributors [in mixed source samples].” More specifically, defendant challenges the deoxyribonucleic acid testing of his jeans and the victim’s reference sample. Judge Fulgoni defined the technology in question, “The (new) technology involved in this case is a technology which purports to identify the DNA at a crime scene compared with samples donated by suspects and victims to see if a match can be declared that incriminates the defendant or not.”

a. The *Kelly* Test

Formerly, the federal rule for evaluating the admissibility of new scientific evidence was that specified in *Frye v. United States* (D.C. Cir. 1923) 293 F. 1013, 1014. *Frye* was adopted by the California Supreme Court in *People v. Kelly, supra*, 17 Cal.3d at page 32. (See *People v. Venegas* (1998) 18 Cal.4th 47, 76; *People v. Leahy* (1994) 8 Cal.4th 587, 594.) In *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993) 509 U.S. 579, 585-589, the United States Supreme Court held that *Frye* had been abrogated by rule 702 of the Federal Rules of Evidence (28 U.S.C.). (See *United States v. Scheffer* (1998) 523 U.S. 303, 311, fn. 7.) After *Daubert* replaced *Frye* as the pertinent federal court test, the California Supreme Court held, “[W]e conclude that the *Kelly/Frye* formulation (or now more accurately, the *Kelly* formulation) should remain a prerequisite to the admission of expert testimony regarding new scientific methodology in this state.” (*People v. Leahy, supra*, 8 Cal.4th at p. 591; see *People v. Venegas, supra*, 18 Cal.4th at p. 76, fn. 30.) In *Kelly*, the California Supreme Court set forth the following “general principles of admissibility” for opinion testimony based on new scientific techniques: “(1) [T]he *reliability of the method* must be established, usually by expert testimony, and (2) the witness furnishing such testimony must be properly *qualified as an expert to give*

an opinion on the subject. [Citations.] Additionally, the proponent of the evidence must demonstrate that correct scientific procedures were used in the particular case. [Citations.]” (*People v. Kelly, supra*, 17 Cal.3d at p. 30, original italics; see also *People v. Diaz* (1992) 3 Cal.4th 495, 526.) In *People v. Soto* (1999) 21 Cal.4th 512, 519, the California Supreme Court held: “However, *Kelly* ‘does not demand that the court decide whether the procedure is reliable as a matter of scientific fact: the court merely determines from the professional literature and expert testimony whether or not the new scientific technique is accepted as reliable in the relevant scientific community and whether ““scientists significant either in number or expertise publicly oppose [a technique] as unreliable.”” [Citations.]’ (*People v. Axell* (1991) 235 Cal.App.3d 836, 854 []) ““General acceptance” under *Kelly* means a consensus drawn from a typical cross-section of the relevant, qualified scientific community.’ (*People v. Leahy, supra*, 8 Cal.4th at p. 612.)” Moreover, the California Supreme Court has held: “[T]he trial courts, in determining the general acceptance issue, must consider the quality, as well as quantity, of the evidence supporting or opposing a new scientific technique. Mere numerical majority support or opposition by persons minimally qualified to state an authoritative opinion is of little value” (*People v. Leahy, supra*, 8 Cal.4th at p. 612; accord, *People v. Venegas, supra*, 18 Cal.4th at p. 85.) Defendant’s challenge relates only to the first prong of the *Kelly* test—whether the mixed samples testing that occurred in the present case meets the *Kelly* reliability test.

b. description of deoxyribonucleic acid

In the recent case of *U.S. v. Trala* (D. Del. 2001) 162 F.Supp.2d 336, 339-340, the District Court of Delaware explained the basic principles pertaining to deoxyribonucleic acid: “Each human body contains a large number of cells, each of which descends from successive divisions of the fertilized egg that was its origin. Virtually all non-reproductive cells in the body contain identical copies of a complex structure called deoxyribonucleic acid or, DNA. This structure represents the genetic code for that

individual. The DNA is in the form of microscopic chromosomes, which are located in the nucleus of a cell. A chromosome is a thread of DNA surrounded by other materials, mainly protein. A fertilized egg contains 23 chromosomes, with one member of each pair being contributed by the mother and father, respectively. Each cell contains identical, duplicates of the 46 cells from the fertilized parent cell. Therefore, each cell in the human body has the same DNA. [¶] The structure of DNA consists of two strands, coiled in the form of a double helix (i.e., a twisted ladder). Each strand is composed of a string or a sequence of nucleotide bases held together by a sugar-phosphate backbone. To use the ladder metaphor, running between the sugar-phosphate strands (the side rails of the ladder) are billions of rungs, each of which is composed of two bases. There are only four possible types of bases—A, T, G, C. ‘A, T, G, C’ represent adenine, thymine, guanine, and cytosine, respectively. The order in which the base pairs appear on the DNA ladder constitutes an individual’s genetic code. [¶] A gene is a particular DNA sequence located along a chromosome, ranging from a few thousand to tens of thousands of base pairs, that produces a specific product in the body. In other words, a gene is a site (a sequence of letters) on the DNA that encodes for a protein. A marker is a site on the DNA that does not code for proteins; the marker is also known as the locus (or location). [¶] In essence, the specific base sequence on the gene acts as an encoded message to the body to produce certain amino acids, which ultimately combine to form a protein. The function of a given gene is determined by the order of bases in the gene. The position that gene occupies along the DNA thread is known as its locus. [¶] Human beings share more biological similarities than differences. Thus, over 99% of human DNA does not vary from person to person. Each person’s DNA, however, has certain regions where the rungs of the ladder will be different. This area where a locus is different is polymorphic. The possible arrangements of base pairs that could occur in one of these polymorphic areas (i.e., the alternative forms of a gene that an individual could possess) are known as alleles. These alleles can result from differences in single base pairs, differences in multiple base pairs, or differences in the number of base pairs found in a given region. The individual genetic makeup described by the alleles is known as the genotype. In

forensic analysis, the genotype for a group of analyzed loci is called the DNA profile. When a sample of DNA is typed, the lab examiner looks at predetermined polymorphic loci, identifies the alleles that make up the DNA sequence at those polymorphic loci, and then determines how likely it is for this sequence to appear in a given population.” (See also Nat. Research Council, *The Evaluation of Forensic DNA Evidence* (1996) pp. 12-14, and glossary, pp. 214-218.)

c. deoxyribonucleic acid testing

In *Trala*, the district court described deoxyribonucleic acid testing as follows: “[Polymerase chain reaction (PCR) testing] is used to amplify targeted loci of the sample of DNA by replicating the process by which DNA duplicates itself naturally. Thus, the lab is able to produce a substantial number of specific, targeted segments of DNA which can then be typed and compared. Short Tandem Repeats, or STR’s, are a group of loci which are used to type and compare the DNA. Finally, statistics are used to evaluate how likely it is that a similar match would occur if the DNA sample were drawn randomly from the population. . . . [¶] a. PCR Amplification Process [¶] PCR, a sample preparation technique, is a laboratory process for copying a short segment of DNA millions of times. The PCR process is analogous to the process by which cells replicate their DNA naturally. *See United States v. Gaines* [(S.D. Fla. 1997)] 979 F.Supp. [1429,] 1435. By using this process, a lab can produce a substantial number of specific, targeted segments of DNA which can then be typed and compared. PCR allows the laboratory to amplify only those specific DNA regions which exhibit genetic variations within the population, allowing for DNA typing. Moreover, the PCR process enables the analysis of very tiny amounts of DNA. PCR also permits the analysis of old and/or degraded DNA samples. [¶] The PCR process is comprised of three steps. First, the double-stranded segment of DNA is separated, or denatured, into two strands by heating. This denatured DNA strand forms a template that can allow the manufacture of a new strand that is identical to its former complimentary strand. [¶] Next, each of the single-strand

segments are hybridized with primers. Primers are short DNA segments that are designed to bind with the template at particular loci. The primers are designed to compliment a sequence just outside of a target sequence of bases. ¶ Finally, each primer serves as a starting point for the replication of the target sequence. In this third step, a type of enzyme called a polymerase becomes active. In essence, the polymerase facilitates repeated additions of bases to the primer until a new, complimentary strand of the targeted DNA locus is created. ¶ This process is repeated a number of times, creating an exponentially increasing number of copies of the targeted area of the original DNA. Eventually, the PCR amplification process yields a sufficient quantity of the DNA sample to be typed. If the laboratory wants to type the DNA sample at multiple sites, it can add additional primers which will bind simultaneously to their respective target sites. This process is known as multiplexing. According to Dr. [Bruce] Budowle [Senior Scientist at the Federal Bureau of Investigation Laboratory Division], multiplexing allows the laboratory to minimize the chance of human error and contamination in the PCR process. Using current technology, the [Federal Bureau of Investigation] laboratory can multiplex up to fifteen or sixteen markers with reliable results. ¶ b. Short Tandem Repeats ¶ The PCR process is performed to amplify a targeted locus (or loci) for analysis. These loci are selected because they are polymorphic, thus, making them amenable to typing. One group of such loci involve a class of repeated units, distributed widely throughout the DNA structure, known as short tandem repeats ('STR's'). A tandem repeat involves multiple copies of an identical DNA sequence arranged in direct succession in a particular region of a chromosome. A STR is a tandem repeat in which the core repeat units are just a few base pairs. Loci containing STRs are scattered throughout the chromosomes in enormous numbers. Such loci have a fairly large number of alleles and are usually capable of unique identification. See *Commonwealth v. Rosier* [(Mass. 1997)] [] 685 N.E.2d 739, 742 []. ¶ Once the amount of DNA is amplified by the PCR process[,], the analyst proceeds to identify fragments of different sizes by their migration in an electric field. In order to detect variations, analyst[s] use a process known as electrophoresis. During the PCR amplification of the STR fragments, the

primers that are used contain fluorescent tags, which become incorporated into the STR fragments during amplification. During electrophoresis, the amplified fragments will pass through a gel and eventually pass through a detection window at the end of the gel. The fragments can be passed through either a flat slab gel or through a small-diameter capillary that contains a gel or liquid polymer. The difference between these two methods is that the flat gel permits multiple samples to be run at the same time, while capillary electrophoresis only permits one sample to be run at a time. The scientific principles underlying both techniques are the same. [¶] After the fragments pass through the detection window at the end of the gel, a laser fires, striking the fluorescent tags, and causing the tags to emit light. A camera will detect the light and convert it into data. By measuring the amount of time that it takes a particular fragment to reach the laser, the laboratory will be able to determine the size of the fragment and, therefore, it will be able to determine the number of sequence repeats. The faster a fragment moves through the window, the smaller it is in size and vice versa. [¶] The data generated is analyzed by an accompanying computer software program which determines the size of the alleles based on the rate at which they reach the window.” (*U.S. v. Trala, supra*, 162 F.Supp.2d at pp. 341-342, fns. omitted; *United States v. Hicks* (9th Cir. 1996) 103 F.3d 837, 844-845; *United States v. Beasley* (8th Cir. 1996) 102 F.3d 1440, 1445-1446; see also Nat. Research Council, *The Evaluation of Forensic DNA Evidence, supra*, pp. 21-23.)

The products used to analyze the deoxyribonucleic acid in all four cases for which the *Kelly* hearing was conducted were manufactured by Perkin-Elmer, which is also known as Applied Biosystems. Utilizing the AmpFLSTR Profiler Plus PCR Amplification Kit, the laboratory is able to amplify nine short tandem repeat loci and amelogenin gender loci. (Exhibit 20, pp. 1-1 – 1-5; see also http://www.appliedbiosystems.com/products/productdetail.cfm?prod_id=100.) In addition, the AmpFLSTR COfiler PCR Amplification Kit amplifies: four short tandem repeats loci; the amelogenin locus; and two of the short tandem repeats loci amplified by Profiler Plus. The Combined DNA Index System (CODIS) was developed by the Federal Bureau of Investigation as a national database containing deoxyribonucleic acid profiles

of convicted felons. By using the AmpFLSTR Profiler Plus PCR Amplification Kit and the AmpFLSTR COfiler PCR Amplification Kit, information is generated regarding all 13 core short tandem repeats loci established by the CODIS. (Budowle, *STR Allele Concordance Between Different Primer Sets – A Brief Summary*, 3 Profiles in DNA, No. 3, pp. 1-2; *U.S. v. Trala*, *supra*, 162 F.Supp.2d at pp. 342-343; see also http://www.appliedbiosystems.com/products/productdetail.cfm?prod_id=97.) The Applied Biosystems Prism 310 genetic analyzer utilizes the Genescan and Genotyper software. This software was described by the district court in *Trala* as follows: “The software detects the light being emitted and converts it into peaks of different sizes. The analyst then compares the configuration of these peaks against known reference standards in order to determine the number of alleles present at the target loci in a given sample.” (*U.S. v. Trala*, *supra*, 162 F.Supp.2d at p. 342; see also *People v. Hill* (2001) 89 Cal.App.4th 48, 57-58; Rosenblum, *Improved Single-Strand DNA Sizing Accuracy in Capillary Electrophoresis* (1997) 25 Nucleic Acids Research, No. 19, pp. 3928, 3929; http://www.appliedbiosystems.com/products/productdetail.cfm?prod_id=38.) As our colleagues in the Court of Appeal for the First Appellate District held: “Once the PCR analysis is complete, there may or may not be a need to perform a statistical analysis. If the subject of the investigation is not compatible with the blood evidence, statistics or genetic frequency data is irrelevant. If the person has the same traits as the evidentiary specimen, then the question is how common or rare are those traits, i.e., what percentage of the population are potential donors of such a specimen.” (*People v. Morganti* (1996) 43 Cal.App.4th 643, 669.) Where the samples of the evidence and the defendant’s deoxyribonucleic acid are found to be sufficiently similar to have originated from the same source, the analyst calculates the profile frequency or the probability that an unrelated person chosen at random from the population would have the same deoxyribonucleic acid profile as the unknown sample. The analyst calculates the statistical frequency by multiplying the frequency of each of the alleles in the profile, then corrects the result to account for inbreeding or substructuring effects in the

population. (See *U.S. v. Trala, supra*, 162 F.Supp.2d at p. 343; *People v. Brown* (2001) 91 Cal.App.4th 623, 634 [substructures].)

As Judge Fulgoni explained in his written decision following the *Kelly* hearing: “[D]ifficult problems concern two further situations which do not occur in pristine samples. [¶] The first is mixtures of DNA sources. In cases of rape, epithelial cells from the victim and the assailant can be present in a swab. Other persons who have had intercourse with the victim can deposit sperm. And frequently there is an inability to separate a sperm fraction from a nonsperm fraction of the evidenced DNA. [¶] There is also frequently an inability to separate major from minor contributors to a mixed evidentiary sample. [¶] The second difficulty is stutter. This is a phenomenon that occurs unpredictably and can mask small alleles or actually be an allele that occurs in a stutter position.”

d. Evidence presented

i. prosecution evidence

Rhonda Roby, the senior forensic specialist for Applied Biosystems, testified as part of the prosecution case. Ms. Roby testified regarding various reports and Applied Biosystems procedures related to AmpFLSTR Profiler Plus and COfiler kits.

Dr. Bruce McCord, associate professor of analytical and forensic chemistry at Ohio University, also testified for the prosecution. In that capacity, Dr. McCord taught classes in deoxyribonucleic acid typing and instrumental analyses. He also did research in the areas of deoxyribonucleic acid analysis. Dr. McCord was previously employed by the Federal Bureau of Investigation, where he taught courses in forensic chromatography and polymerase chain reaction testing using capillary electrophoresis. Dr. McCord published approximately 30 articles. Dr. McCord was also on the editorial boards of the *Journals of Electrophoresis and Capillary Electrophoresis*. He attended and made

presentations at numerous conferences each year related to capillary electrophoresis and human identification.

Dr. McCord conducted tests to check the accuracy of the Applied Biosystems Prism 310 genetic analyzer as compared to those of other manufacturers. Dr. McCord ran approximately 100 to 200 samples that had been initially analyzed by the Applied Biosystems Prism 310 genetic analyzer and compared the results with the Molecular Dynamics prototype system. With one exception, all of the genotypes were exactly the same. The exception was made by the Molecular Dynamics system. Based on his experiments, Dr. McCord concluded that capillary electrophoresis is an effective and efficient technique for use in the genetic typing of polymerase chain reaction amplified deoxyribonucleic acid. Dr. McCord further deduced the results demonstrated the capability of capillary electrophoresis to rapidly and precisely type deoxyribonucleic acid.

Dr. McCord relied in part on an article entitled, “*Validation of STR Typing by Capillary Electrophoresis.*” The article was the result of an Federal Bureau of Investigation validation paper on capillary electrophoresis utilizing the Applied Biosystems Prism 310 genetic analyzer as well as Profiler Plus and COfiler typing kits. The article concluded, “The results support the reliability of 310 for the electrophoresis and detection of DNA samples amplified using Profiler Plus and COfiler and of genescan and genotyper software for sizing and designating alleles.” (Moretti, *Validation of STR Typing by Capillary Electrophoresis* (Federal Bureau of Investigation, 1999) pp. 25-26.) Based on his education, professional experience with the Applied Biosystems Prism 310 genetic analyzer, review of peer review literature and papers he had written, attendance at conferences where electrophoresis results were presented, and discussions with other scientists, Dr. McCord believed that capillary electrophoresis and specifically the Applied Biosystems Prism 310 genetic analyzer are accepted in the scientific community for the analysis of short tandem repeats loci used in criminal cases. Dr. McCord believed the Applied Biosystems Prism 310 genetic analyzer provides precise data regarding fragments analyzed in short tandem repeats loci utilizing AmpFLSTR Profiler Plus and

COfiler kits. Dr. McCord testified he wrote an article entitled, *The Application of Capillary Electrophoresis in the Analysis of PCR Products Used in Forensic DNA Typing*. In that article, Dr. McCord explained that when analyzing a mixed sample using the Applied Biosystems Prism 310, a competent analyst can determine more precisely which individual is the major contributor and which one is the minor contributor.

Dr. McCord also wrote a chapter related to capillary electrophoresis in forensic biology and deoxyribonucleic acid mixture analysis using the Applied Biosystems Prism 310 in a book written by Eric Buel, a lead scientist from the Vermont state crime laboratory. The chapter describes the quality control factors required to ensure accurate measurement of mixed samples.

Dr. Robin Cotton, forensic laboratory director for Cellmark Diagnostics, testified for the prosecution. Dr. Cotton was responsible for the supervision of all forensic case work conducted at Cellmark Diagnostics, including research and validation. Dr. Cotton was a member of the: American Academy of Forensic Sciences; American Society of Human Genetics; and American Society of Crime Laboratory Directors. Dr. Cotton was also a fellow of the American Academy of Forensic Science. Dr. Cotton attended and made presentations at professional meetings regarding short tandem repeats forensic case work. Cellmark Diagnostics used the Profiler Plus and COfiler to type both unknown evidence samples and reference samples. Cellmark Diagnostics conducted a series of experiments for purposes of validating the use of the Profiler Plus and COfiler systems on the Applied Biosystems Prism 310 genetic analyzer. Based on those experiments, Cellmark Diagnostics established a stutter value per locus per allele percentage. That data is utilized when examining non-optimal samples. Cellmark Diagnostics conducted similar experiments with mixed sample analysis. Its standard operating procedures were derived from the validation studies conducted on Profiler Plus and COfiler and other deoxyribonucleic acid typing systems.

Dr. Cotton believed the Profiler Plus and COfiler systems were generally accepted within the forensic community for the typing of samples such as in the present case.

Dr. Cotton's belief was based upon several factors: the number of actual users of these

kits in the forensic community for the same purpose utilized in these cases; numerous papers in the general scientific literature regarding the use of short tandem repeats for genetic mapping; the use of the same detection technology by forensic science groups outside the United States; the wide use of Perkin-Elmer instruments because of their versatility and reliability as supported by a large body of scientific peer review literature; and the use of genescan and genotyper was not unique to forensics. Based on validation experiences in the Cellmark Diagnostics lab as well as those of the peer review community, Dr. Cotton believed the use of these kits to evaluate a sample involving a forensic mixture will give reliable results when used correctly by those with appropriate experience.

Dr. Arthur J. Eisenberg, associate professor in the Department of Pathology and Anatomy at the University of North Texas Health Science Center and director of the DNA Identity Laboratory and Gene Link Repository, testified for the prosecution. Dr. Eisenberg taught medical students in the applications of deoxyribonucleic acid based molecular biological technology. Dr. Eisenberg also taught in a graduate program in forensic molecular genetics. As director of the deoxyribonucleic acid laboratory, Dr. Eisenberg was responsible for the operation of the lab, including techniques used, training of technicians, and assignment of reports on case work samples processed. Dr. Eisenberg also served as chairperson of the DNA Advisory Board. In addition to other systems, Dr. Eisenberg's laboratory utilized two Applied Biosystems Prism 310 fluorescent detection systems as well as Profiler Plus and COfiler kits.

Dr. Eisenberg previously worked at Life Codes Corporation, where his responsibilities included the development of methodologies, reagents, and materials utilized in the various human identification systems. Dr. Eisenberg was also a member of the: American Association of Blood Banks; American Academy of Forensic Science; Working Group on DNA Analysis Methods; and the Association of Forensic Lab Analysts. Dr. Eisenberg was involved in the writing of the Technical Working Group on DNA Analysis Methods and DNA Advisory Board guidelines. He also presented numerous papers at professional forensic science meetings. Dr. Eisenberg believed the

Profiler Plus and COfiler kits had been properly validated for the use in forensic case work in the United States because they had been “scrutinized by literally hundreds of laboratories throughout the world” subject to the standards specified by the DNA Advisory Board. The systems were examined through concordant studies on a wide variety of adjudicated forensic evidence samples, in terms of dilutions and mixtures, and found to have reliable, accurate typing results.

Dr. Eisenberg participated in the audits of crime scene forensic laboratories throughout the country. Dr. Eisenberg was familiar with people’s exhibit No. 40, a paper prepared by the Federal Bureau of Investigation, which detailed the validation studies related to commercial kits for short tandem repeats multiplexing, including Profiler Plus and COfiler kits. (Moretti, *Validation of Short Tandem Repeats (STRs) for Forensic Usage: Performance Testing of Fluorescent Multiplex STR Systems and Analysis of Authentic and Simulated Forensic Samples* (Federal Bureau of Investigation 1999).)

Dr. Eisenberg agreed with the conclusions that the procedures used in those commercial kits were robust and reliable. Dr. Eisenberg also believed the criteria for evaluating a forensic mixture as set forth in the Federal Bureau of Investigation paper were adequately understood and discussed within the literature and the scientific community.

Dr. Eisenberg believed that primer binding mutation may occur in the analysis of a sample. But Dr. Eisenberg believed primer binding imitation was of no consequence in the interpretation of the results because what affects the known sample will also affect the evidentiary sample. Dr. Eisenberg believed Cellmark Diagnostics was “a very competent, thorough testing laboratory” that “strive[s] to do the best possible job they can and in general produce very good, quality results.”

The prosecution’s final witness was Dr. Frederick Robert Beiber, associate professor of pathology at Harvard Medical School. Dr. Beiber taught medical and graduate students on subjects related to genetics, pathology, and forensic science. Dr. Beiber was also a medical geneticist at the Brigham and Women’s Hospital in Boston. Further, Dr. Beiber was a member of the: DNA Advisory Board; Technical Working Group on DNA Analysis Methods; American Society of Human Genetics, the

American Board of American Genetics; American Academy and Forensic Science; and American Prosecutors Research Institute. He also served as a consultant to the Connecticut State Police forensic science laboratory. In addition, Dr. Beiber attended annual forensic meetings and authored publications in peer review journals and books. In the year 2000, Dr. Beiber authored a paper entitled, "Combined Probability of Exclusion Estimates, Their Use in Forensic Analysis of Complex DNA Mixtures."

Dr. Beiber believed: the Profiler Plus and COfiler kits had been widely used in 70 to 80 percent of the crime labs in North America and other parts of the world; the reliability of these kits had been validated by the various labs; the Profiler Plus and COfiler kits rendered reliable results when used properly and correctly; and that primer binding site mutations had no effect in any particular individual case because "samples from known individuals and samples from evidentiary exhibits would be typed or profiled using the same reagent . . . or the same kit, using the same primers." As a result, if the deoxyribonucleic acid sample comes from a single individual, it would be the same. Dr. Beiber concluded, "[T]he net effect of the presence of these variations would be negligible on the determination of allele or genotype or profile frequencies, virtually no effect." With respect to mixed forensic samples, Dr. Beiber testified: "[I]n the context of sexual assaults, when intimate samples are taken, mixtures tend to be often the rule rather than the exception [O]nce the electropherograms are obtained from the various samples and the known individuals, it's often possible to quite clearly identify a so-called major contributor and a so-called minor contributor through the DNA mixture from the evidence." Dr. Beiber further related that the calculation for a mixed sample is essentially the same calculation made in single source samples.

The prosecution also introduced as exhibits: various manuscripts; validation studies; operating procedures utilized by Cellmark Diagnostics; publications; professional manuscripts and presentations attributable to professional scientific conferences; and related court decisions. The substance of some of these exhibits will be discussed later.

ii. defense evidence

The defense called Marc Taylor, a forensic scientist and owner of a laboratory known as Technical Associates Incorporated. In the course of his business, Mr. Taylor reviewed forensic casework involving deoxyribonucleic acid evidence. These cases utilized the Applied Biosystems Prism 310 genetic analyzer as well as Profiler Plus and Cofiler kits, and genescan and genotyper programs. Mr. Taylor reviewed the validation studies filed under protective order in this case by Perkin-Elmer (Applied Biosystems). Mr. Taylor testified that the articles did not appear to be a complete validation in the context of the Technical Working Group on DNA Analysis Methods guidelines. Mr. Taylor's comparison of Federal Bureau of Investigation validation studies on Profiler Plus and COfiler with Perkin-Elmer's data demonstrated different percentages of stutter occurrence as well as different peak-height ratios at one locus. Mr. Taylor acknowledged that there were over a hundred validation studies on the loci that are used in the Profiler Plus and COfiler. Mr. Taylor also agreed that much of the data already in the public domain of the scientific community applied to some extent to Profiler Plus and COfiler kits.

Dr. Laurence Mueller, a professor at the University of California at Irvine, testified for the defense. Dr. Mueller did research related to population genetics and evolutionary biology. Dr. Mueller was an editor of a journal entitled "Researches on Population Ecology." He also studied forensic issues regarding population studies related to deoxyribonucleic acid evidence, lectured on the subject, published papers, and reviewed databases and casework from forensic laboratories. Dr. Mueller explained the "Hardy-Weinberg law" as follows: "[It involves an estimation of] how likely it would be to find a person in the population that has [a] particular combination of copies of [a] gene that you observe in the evidence. . . . If a person has two similar copies of a gene then that individual's called a homozygote, and the frequency of that pattern is given by the Hardy-Weinberg law simply by taking the frequency of that genetic variant or allele and squaring it or multiplying it by itself. [¶] If the individual has two different forms of the

particular gene, the individual is called a heterozygote. And the Hardy-Weinberg law states that the frequency of people that will be heterozygote for that particular combination of alleles is given by twice the product of the constituent allele frequency.” Dr. Mueller believed that if a particular allele was not properly amplified in the polymerase chain reaction so that only one of the two copies of that individual’s gene was amplified, the individual may be a heterozygote but appear to be a homozygote, thereby causing a departure from the Hardy-Weinberg law.

Dr. Mueller’s review of the Federal Bureau of Investigation population databases for Caucasian and African-American groups revealed a 13 to 14 percent departure from linkage equilibrium. That signaled a potential problem with the assumption of linkage equilibrium for the Caucasian population that is correctable. There were no significant departures of linkage equilibrium for the African-American population. Also, the 13 to 14 percent departure presented a fundamental problem with a technique based on multiplication across loci. Dr. Mueller also reviewed reports related to the Perkin-Elmer databases for the 13 CODIS loci contained within Profiler Plus and COfiler. Dr. Mueller testified he needed further data regarding the complete multi-locus genotypes for each of the samples used to fully analyze the database utilized by Perkin-Elmer. Dr. Mueller acknowledged that scientists who prepare peer review articles normally present data by providing the allele frequencies rather than the genotype profiles for each person in the database.

Dr. William Shields, a professor at the State University of New York, College of Environmental Science and Forestry, also testified for the defense. Dr. Shields taught and did research in population genetics and behavior of birds and mammals. Dr. Shields performed deoxyribonucleic acid typing in his work. Dr. Shields did not personally perform forensic deoxyribonucleic acid testing but had reviewed the literature on the procedures. Dr. Shields supervised deoxyribonucleic acid testing at the university to determine maternity and paternity in swallows, beavers, and giraffes as well as to examine genetic verification in rare or endangered species. Dr. Shields previously testified on the issue of validation sufficiency as it relates to Profiler Plus and COfiler as

related to population genetic issues. Dr. Shields had modified protocols designed by others, but had not designed one himself.

Dr. Shields had never worked with capillary electrophoresis or done any criminal forensic case work. Dr. Shields had studied literature regarding validation studies and testified about the specific kits. Dr. Shields reviewed the Perkin-Elmer documents in people's exhibit Nos. 14 through 17 related to the validation of Profiler Plus and COfiler. Dr. Shields found the manuscripts lacking in data. Dr. Shields believed the validation report, people's exhibit No. 16, was inadequate because the sample sizes were too small to determine the error rate. When comparing the Perkin-Elmer data to that developed by the Federal Bureau of Investigation, Dr. Shields found "hard-to-explain" differences between the two. Dr. Shields testified he would like to see all laboratories have sufficient data to remove as much subjectivity from the testing process as possible.

The defense also called Dr. Donald Riley, Associate Professor of Urology and Pathobiology at the University of Washington. Dr. Riley conducted research related to prostate diseases, including deoxyribonucleic acid testing. The testing was performed to detect bacterial and viral deoxyribonucleic acid sequencing as well as genetic difference in various individuals. Dr. Riley also served as a reviewer of manuscripts submitted by other scientists to determine whether the paper is worthy of publication in a journal. Dr. Riley authored an article describing optimal hybridization temperatures for another type of deoxyribonucleic acid testing. Dr. Riley testified concerning polymerase chain reaction based testing approximately 50 times. Dr. Riley visited crime laboratories, including Cellmark Diagnostics, where he observed forensic testing. Dr. Riley did not conduct multiplex polymerase chain reaction testing.

Dr. Riley reviewed people's exhibit No. 20, the Profiler Plus polymerase chain reaction amplification kit user's manual. Dr. Riley believed the denaturing temperature at which the COfiler and Profiler Plus operated did not support the user's manual's representation that they were optimized to give reliable performance. However, Dr. Riley acknowledged that other articles supported the user's manual's claims. Dr. Riley did not believe that Perkin-Elmer provided adequate data regarding degraded

deoxyribonucleic acid in the user's manual or in the relevant professional literature. Dr. Riley also believed the mixed specimen studies outlined in the user's manual did not indicate that the limitations of the system had been thoroughly reviewed. Nor did Dr. Riley believe the article written by Dr. Clyde Holt, people's exhibit No. 41, gave members of the scientific community adequate data to determine whether the manufacturer's claims were accurate. Dr. Riley was concerned with contamination, degradation and accuracy with the Profiler Plus, COfiler systems and Applied Biosystems Prism 310 genetic analyzer. Dr. Riley believed that the Profiler Plus and COfiler systems and Applied Biosystems Prism 310 genetic analyzer were not generally accepted for testing mixed forensic samples.

Dr. Kenneth Berger, Vice President of regulatory affairs at Lifepoint, Incorporated, testified for the defense. Dr. Berger's work experience involved the development of systems for quality assurance and product validation. At the time of his testimony, Dr. Berger was involved with the validation of saliva-based test kits for use with drugs and alcohol. Most of Dr. Berger's work related to validations by the Food and Drug Administration. Dr. Berger reviewed people's exhibit Nos. 15, 16, and 17 as well as the Perkin-Elmer user's manuals as well as other articles on the subject of short tandem repeats and capillary electrophoresis. Dr. Berger acknowledged that these documents contained the results of some validation studies. However, he did not believe any of those articles were complete validations. Dr. Berger was unaware how Profiler Plus and COfiler were used. Dr. Berger had never run a capillary electrophoresis platform or the Applied Biosystems Prism 310 genetic analyzer. Judge Fulgoni determined that Dr. Berger was not qualified to testify regarding capillary electrophoresis and limited his testimony to validation.

e. prior validation and acceptance of mixed sample analysis

We agree with the Attorney General that the use of polymerase chain reaction and short tandem repeats technology to analyze a mixed-source forensic sample is neither a new or

novel technique or methodology. As the Attorney General points out, several published rape cases involve mixed source samples that were analyzed by polymerase chain reaction or short tandem repeats. In *People v. Hill, supra*, 89 Cal.App.4th at pages 52-53, the victim was raped and sodomized by an intruder in her home. Vaginal and anal swabs were submitted for deoxyribonucleic acid testing. The forensic lab utilized a DQ-Alpha Polymarker test and a Profiler Plus test. The Profiler Plus test indicated the sperm's deoxyribonucleic acid and the defendant's deoxyribonucleic acid "had a unique genetic profile occurring in only one of 5.89 trillion African-Americans." (*Id.* at p. 53.) The other test found the defendant could not be excluded as a source of the sperm deoxyribonucleic acid. (*Ibid.*) In finding the Profiler Plus test kit did not embrace new scientific techniques, our colleagues in Division Six of this appellate district found: "California courts have recognized that two methodologies are widely used in forensic DNA testing: restriction fragment length polymorphism (RFLP) and PCR. (*People v. Venegas* [, *supra*,] 18 Cal.4th [at pp.] 57-58 & fn. 6 [].) There are three subtypes of PCR testing: DQ-Alpha, which tests a single genetic marker; Polymarker, which tests five genetic markers; and the STR, which tests three or more genetic markers. (*People v. Allen* [(1999)] 72 Cal.App.4th [1093,] 1097.) The RFLP and PCR methodologies, including the PCR subtypes, have acquired general acceptance in the scientific community. (*People v. Venegas, supra*, 18 Cal.4th at p. 79 [RFLP]; *People v. Wright* (1998) 62 Cal.App.4th 31, 34 [] [PCR/Polymarker]; *People v. Morganti, supra*, 43 Cal.App.4th at p. 666 [PCR/DQ-Alpha]; *People v. Allen, supra*, 72 Cal.App.4th at p. 1100 [PCR/STR].)" (*People v. Hill, supra*, 89 Cal.App.4th at p. 57.)

In *People v. Wright, supra*, 62 Cal.App.4th at pages 35-36, the defendant repeatedly raped a young girl and forced her to orally copulate him. Oral and vaginal swabs were submitted for forensic testing. The trial court and our colleagues in the Court of Appeal for the First Appellate District found that the polymerase chain reaction testing method utilized in that case was generally accepted as reliable and valid in the scientific community. (*Id.* at pp. 38-41.) As the *Wright* court pointed out: "[C]ase-by-case adjudication as to the "general acceptance" prong of the *Kelly* test is *not* required once

the scientific technique in question has been endorsed in a published appellate opinion. ([*People v. Barney*] [(1992)] 8 Cal.App.4th [798,] 824-825.)’ (*Morganti, supra*, 43 Cal.App.4th at p. 658, italics added.)” (*People v. Wright, supra*, 62 Cal.App.4th at p. 42, fn. 2.)

More recently, in *U.S. v. Trala, supra*, 162 F.Supp.2d at page 349, the defendant, as does defendant here, specifically challenged the reliability of a *mixed* deoxyribonucleic acid sample utilizing the Profiler Plus and COfiler materials kits in combination with Genoscan and Genotyper software. The defendant in *Trala* claimed the systems had allelic drop out, stutter and differential amplification and problems that would “have to ‘be explained away through numbers set by laboratories to obtain a profile.’” (*U.S. v. Trala, supra*, 162 F.Supp.2d at p. 349.) After extensive testimony by competent professionals and the introduction of laboratory protocol evidence, the district court, after applying the standards of *Daubert v. Merrell Dow Pharmaceuticals Inc., supra*, 509 U.S. at pages 589-590, held, “In light of the controls to reduce the effects of inherent flaws such as stutter or allelic drop out, the court finds that the defendant’s challenges are directed to the weight of the evidence and not its admissibility.” (*U.S. v. Trala, supra*, 162 F.Supp.2d at p. 349.)

- f. The deoxyribonucleic acid evidence, based upon analysis of mixed samples, was properly found to be generally accepted in the scientific community

In any event, even if the acceptance of such analysis was not previously established, the evidence presented at the *Kelly* hearing in this case supports Judge Fulgoni’s finding. The trial court may consider the testimony of professionals in the field, decisions from other jurisdictions, and relevant scientific literature. (*People v. Brown* (1985) 40 Cal.3d 512, 530; *People v. Axell, supra*, 235 Cal.App.3d at p. 854; *People v. Smith* (1989) 215 Cal.App.3d 19, 25; *People v. Reilly* (1987) 196 Cal.App.3d 1127, 1134.) In *People v. Morganti, supra*, 43 Cal.App.4th at page 665, the court noted:

“As our Supreme Court has recently confirmed, *Kelly* does not demand absolute unanimity of views in the scientific community. (*People v. Leahy, supra*, 8 Cal.4th at pp. 611-612.) “[I]f a fair overview of the literature discloses that scientists significant either in number or expertise publicly oppose [the technique] as unreliable, the court may safely conclude there is no such consensus at the present time.” (*Id.* at p. 611, quoting *People v. Shirley* [(1982)] 31 Cal.3d [18,] 56.)” The general acceptance issue is a mixed question of law and fact. (*People v. Reeves* (2001) 91 Cal.App.4th 14, 38; *People v. Hill, supra*, 89 Cal.App.4th at p. 57.) When the trial court concludes that a new scientific technique is generally accepted in the scientific community, we independently review that decision. (*People v. Venegas, supra*, 18 Cal.4th at pp. 84-85; *People v. Ashmus* (1991) 54 Cal.3d 932, 971.)

Judge Fulgoni noted that while all of the defense witnesses were either qualified scientists or had laboratory experience in related forensic technology or validation of new drugs, none had any “appreciable experience in the application or evaluation of capillary electrophoresis in a forensic setting.” Judge Fulgoni also noted, “Even more importantly, the defense witnesses do not regularly attend forensic meetings or have much contact with persons who do.” On the other hand, Judge Fulgoni stated, “The People’s witnesses in contrast, while lacking a great deal of hands-on experience with forensic samples, regularly attend forensic meetings, are conversant with the forensic community doing capillary electrophoresis, and supervise persons who are technicians in the field.” Judge Fulgoni emphasized that validation of a new technique, while critical, is not synonymous with general acceptance within the scientific community. Judge Fulgoni noted, “The hearing[] failed to disclose a single article challenging the general acceptance of the technique in forensics.” There were excellent results from concordance studies involving comparison of results of the same testing completed by two distinct laboratories. Judge Fulgoni found that the revelation of a laboratory’s error rate was inappropriate, “[E]vidence of the error rate, the causes of errors, their magnitude and even possible causes of errors not detected are all admissible as separate evidentiary categories, and their significance or lack thereof can be argued vigorously by both sides.”

Judge Fulgoni found, “While validation of a new technique is critical since any technique which is generally accepted without some form of validation would be accepted irrationally, validation and general acceptance are not synonymous.” Judge Fulgoni noted that once the four then sealed manuscripts were released by Applied Biosystems (people’s exh. Nos. 14-17) their content was extremely helpful. (Budowle, *STR Allele Concordance Between Different Primer Sets – A Brief Summary*, *supra*; Fregeau, *Fingerprint Enhancement Revisited and the Effects of Blood Enhancement Chemicals on Subsequent Profiler Plus™ Fluorescent Short Tandem Repeat DNA Analysis of Fresh and Aged Bloody Fingerprints*, *Journal of Forensic Sciences* (2000); Moretti, *Validation of STR Typing by Capillary Electrophoresis*, *supra*; Budowle, *Concordance Study on Population Database Samples Using the PowerPlex™ 16 Kit and AmpFLSTR® Profiler Plus™ Kit and AmpFLSTR® COfiler™ Kit* (Federal Bureau of Investigation 2000); Moretti, *Validation of Short Tandem Repeats (STRs) for Forensic Usage: Performance Testing of Fluorescent Multiplex STR Systems and Analysis of Authentic and Simulated Forensic Samples*, *supra*; and Holt, *Practical Applications of Genotype Surveys for Forensic STR Testing* (2000) 112 *Forensic Science International* 91.) Judge Fulgoni held: “The requirement that every possibility, real or imagined, that might beset a technology must be addressed in a published article mischaracterizes the nature of both validation and general scientific acceptance. [¶] A technology can be partially validated by recognition of previously demonstrated principles which are obviously applicable to the new technology.” Additionally, Judge Fulgoni relied on a collection of 33 articles from the *Journal of Forensic Sciences*. In reaching his conclusion, Judge Fulgoni also relied on forensic community meetings: “Furthermore, the exposure of these techniques to the forensic community at meetings devoted largely to this and related technology serves the twin requirements of validation and acceptance. The former is served by discussions, seminars, posters and lectures on the use of the techniques, their problems and how to compensate for and overcome them. The latter is shown by the number of attendees, their exposure to persons who use capillary electrophoresis and their failure to point out any defects of substantial significance.”

Judge Fulgoni further relied on concordance studies completed by the Federal Bureau of Investigation and the Los Angeles County Sheriff's Department, where in his view, excellent results were obtained. In his decision, Justice Fulgoni explored the various possibilities for error in the analysis of deoxyribonucleic acid by those systems in question. In each instance, he explained that procedures may be put in place to detect and prevent such errors.

Judge Fulgoni's findings were supported by the testimony and documents presented. Dr. McCord's testimony was premised on his education, professional experience with the Applied Biosystems Prism 310 genetic analyzer, review of peer review literature and papers he had written, attendance at conferences where electrophoresis results were presented, and discussions with other scientists. Dr. McCord believed that capillary electrophoresis in general and specifically the Applied Biosystems Prism 310 genetic analyzer are accepted in the scientific community for the analysis of short tandem repeats loci used in criminal cases. Dr. McCord also believed the Applied Biosystems Prism 310 genetic analyzer provides precise data regarding fragments analyzed in short tandem repeats loci utilizing AmpFLSTR Profiler Plus and COfiler kits. Dr. McCord further testified that, as explained in an article he wrote, *The Application of Capillary Electrophoresis in the Analysis of PCR Products Used in Forensic DNA Typing*, he found that when analyzing a mixed sample using the Applied Biosystems Prism 310, the analyst can determine more precisely which individual is the major and which person is the minor contributor.

Dr. Cotton testified that the Cellmark Diagnostics staff conducted experiments with the Profiler Plus and COfiler systems on the genetic analyzer for purposes of validation with both single and mixed samples. Dr. Cotton reported that Cellmark's operating procedures were based on other validation studies conducted on Profiler Plus, COfiler, and other deoxyribonucleic acid typing systems. Dr. Cotton believed the Profiler Plus and COfiler systems were generally accepted within the forensic community based upon: the number of forensic scientists using the systems for the same purpose utilized in these cases; numerous papers published in scientific literature regarding the

use of short tandem repeats for genetic mapping; use of the technology outside the United States; and the support of peer review literature. Dr. Eisenberg believed the Profiler Plus and COfiler kits had been properly validated for use in the scientific community because they had been “scrutinized by literally hundreds of laboratories throughout the world” subject to the standards specified by the DNA Advisory Board. Based on their personal experience, review of the extensive literature, studies, presentations at forensic conferences, and laboratory protocols, Dr. Cotton, Dr. Eisenberg, and Dr. Beiber all believed the use of the kits to evaluate mixed forensic samples would give reliable results when used correctly by those with appropriate experience.

The literature relied on by Judge Fulgoni further supports his findings. In people’s exhibit No. 25, the author, Dr. Budowle, of the Federal Bureau of Investigation Scientific Analysis Section, reviewed the short tandem repeats allele concordance between different primer sets, including Profiler Plus and COfiler. Dr. Budowle concluded the Perkin-Elmer kits did not produce significant levels of allele dropout and produced reliable results as long as proper protocols were used. (Budowle, *STR Allele Concordance Between Different Primer Sets – A Brief Summary*, *supra*, p. 2.) People’s exhibit No. 35, an article published in the Journal of Forensic Science in the year 2000, explored the effects of blood enhancement chemicals used for enhancing latent fingerprints from blood on subsequent Profiler Plus deoxyribonucleic acid analysis. The authors concluded none of the chemicals examined had a deleterious effect on the polymerase chain reaction amplification of the nine short tandem repeats systems or the gender marker. (Fregeau, *Fingerprint Enhancement Revisited and the Effects of Blood Enhancement Chemicals on Subsequent Profiler Plus™ Fluorescent Short Tandem Repeat DNA Analysis of Fresh and Aged Bloody Fingerprints*, *supra*, p. 369.) People’s exhibit No. 38, a paper entitled *Validation of STR Typing by Capillary Electrophoresis*, concluded: “In addition to resolving and accurately designating alleles in single-source samples, the analysis of forensic samples may require the identification of components of mixtures of DNA from two or more donors. . . . [T]he analytical parameters used on the [Applied Biosystems] Prism 310 are effective operationally, and comparisons in forensic casework can be

reliably made. . . .” (Moretti, *Validation of STR Typing by Capillary Electrophoresis*, *supra*, p. 19.) These results support the reliability of the Applied Biosystems Prism 310 Genetic Analyzer for the electrophoresis and detection of DNA samples amplified using the AmpFLSTR Profiler Plus and COfiler PCR Amplification kits and of the Genescan and Genotyper software for sizing and designating alleles. (*Id.* at pp. 25-26.) People’s exhibit No. 39 was a concordance study on population database samples. Dr. Budowle and Cynthia J. Sprecher, senior scientists at the Federal Bureau of Investigation and Promega Corporation respectively, concluded: “[O]ver 500 samples were typed and allele drop-out was observed rarely using primers from either manufacturer’s kit. Although allele drop-out can never be entirely eliminated, the extant data suggest that the primers used in the . . . Profiler Plus™, and COfiler™ kits are reliable for typing reference samples destined for use in CODIS. Furthermore, the data support that the sequences of the primers for STR loci do not need to be known to demonstrate validity.” (Budowle, *Concordance Study on Population Database Samples Using the Powerplex™ 16 Kit and AmpFLSTR® Profiler Plus™ Kit and AmpFLSTR® COfiler™ Kit*, *supra*, p. 10.) People’s exhibit No. 40 was a validation study on short tandem repeats for forensic usage conducted by the Federal Bureau of Investigation Forensic Science Research Unit. The study concluded Profiler Plus and COfiler could be used to amplify and type short tandem repeats loci successfully from human biological specimens, including samples that include deoxyribonucleic acid from more than one contributor. (Moretti, *Validation of Short Tandem Repeats (STRs) for Forensic Usage: Performance Testing of Fluorescent Multiplex STR Systems and Analysis of Authentic and Simulated Forensic Samples*, *supra*, pp. 28-29.) People’s exhibit No. 41, an article published in Forensic Science International, concluded that the product rule across the 13 short tandem repeats loci utilized in AmpFLSTR Profiler Plus test kits and the Applied Biosystems Prism 310 Genetic Analyzer is valid for estimation of multilocus genotype frequencies for human identification applications in African-American and Caucasian databases. (Holt, *Practical Applications of Genotype Surveys for Forensic STR Testing*; *supra*; pp. 94, 104-106.) Finally, people’s exhibit No. 43, a collection of 33 articles from

the Journal of Forensic Sciences (2000), included typing studies by means of short tandem repeats and polymerase chain reaction for world populations as well as the extraction of deoxyribonucleic acid from such diverse sources as stamps, envelope flaps, fingernails, toothbrushes, and fingerprints.

In addition, although Perkin-Elmer validation studies for Profiler Plus and COfiler, introduced at the *Kelly* hearing as people's exhibit Nos. 15-17, were sealed and relied upon by the witnesses subject to a protective order, they were subsequently published. We took judicial notice of these articles as well as two others published subsequent to the hearing, which were filed by the Attorney General and serve to support Judge Fulgoni's finding. (See *People v. Shirley*, *supra*, 31 Cal.3d at p. 56; *People v. Barney*, *supra*, 8 Cal.App.4th at p. 810; *People v. Axell*, *supra*, 235 Cal.App.3d at p. 854.) The three validation studies conclude that the test kits, when used with designated procedures, provide robust, reliable results in mixed deoxyribonucleic acid samples. In an article appearing in the Journal of Forensic Sciences, "*NIST Mixed Stain Studies #1 and #2: Interlaboratory Comparison of DNA Quantification Practice and Short Tandem Repeat Multiplex Performance with Multiple-Source Samples*," two interlaboratory comparison exercises conducted by the National Institute of Standards and Technology concluded: "Given an appropriate total amount of DNA in the reaction mixture, current STR multiplex systems reliably amplify multiple-source DNA." (Duewer, *NIST Mixed Stain Studies #1 and #2: Interlaboratory Comparison of DNA Quantification Practice and Short Tandem Repeat Multiplex Performance With Multiple-Source Samples* (2001) 46 J. Forensic Sci. 1199, 1209.)

Finally, another article in the Journal of Forensic Sciences validated Profiler Plus and COfiler testing as robust and reproducible according to the guidelines provided by The Working Group on DNA Analysis Methods. The study involved mixed samples. The authors concluded: "The multiplex systems coupled with CE instrumentation, provide sensitive, accurate results even when forensic samples are exposed to extreme conditions. These attributes make the Profiler Plus and COfiler amplification kits powerful, investigative tools for the analysis of forensic samples." (LaFountain,

TWGDAM Validation of the AmpFLSTR Profiler Plus and AmpFLSTR COfiler STR Multiplex Systems Using Capillary Electrophoresis (2001) 46 J. Forensic Sci. 1197.)

Judge Fulgoni's finding that the mixed sample analysis of deoxyribonucleic acid by means of short tandem repeats utilizing Profiler Plus and COfiler in conjunction with the Applied Biosystems Prism 310 Genetic Analyzer is accepted by the scientific community was well-reasoned, based upon extensive opinion testimony presented by competent professionals and exhaustive review of the literature and decisional authority. Moreover, any challenges regarding errors in multiple sample deoxyribonucleic acid analysis should be directed to the weight of the evidence and not its admissibility.

g. *Kelly* prong three findings

Defendant further argues that: “[The criminalist, Mr. Colman,] did not establish that he had followed correct scientific procedures in determining that all of the alleles he attributed to victim Mathis were in fact alleles from a single person.” Defendant further argues that Mr. Colman employed the “product rule” in establishing the likelihood of a match. As mentioned previously, prong three of the *Kelly* test requires: “[T]he proponent of the evidence must demonstrate that correct scientific procedures were used in the particular case. [Citations.]” (*People v. Kelly, supra*, 17 Cal.3d at p. 30; see also *People v. Diaz, supra*, 3 Cal.4th at p. 526.)

i. Evidence Code section 402 hearing

Prior to trial, defendant also challenged the admissibility of the deoxyribonucleic acid evidence based on whether the scientific procedures employed by the Los Angeles County Sheriff's Department Crime Laboratory were correct. The trial court conducted a hearing pursuant to Evidence Code section 402 on that issue. Mr. Colman testified regarding his deoxyribonucleic acid analysis of the blood samples in question. The Los Angeles County Sheriff's Department Crime Laboratory is accredited by the American

Society of Crime Laboratory Directors and is subject to inspections to insure compliance with established guidelines. In addition, each case is analyzed by a primary analyst. Thereafter, there is an independent review by a secondary analyst. Finally, each case is subjected to an administrative review. The techniques utilized in this case were those set forth in the guidelines of The Working Group on DNA Analysis Methods and the DNA Advisory Board. In addition, the laboratory has a standard operating procedures manual for deoxyribonucleic acid analysis, which outlines procedures generally accepted within the scientific community. Mr. Colman followed these procedures when he analyzed the blood samples from defendant's blue jeans. As part of the crime laboratory's internal validation, a study of contracted mixtures had previously been conducted. The purpose of the study was to insure that the laboratory technicians could confidently detect the major and minor contributors to a mixed sample. That study also included a concordance intra-laboratory, wherein samples were exchanged with other crime laboratories for retesting and result confirmation. Mr. Colman determined the identity of the major contributor, Mr. Mathis, by assessing the peak amplitudes of the alleles by the relative fluorescence unit of intensity. The major peaks include 80 percent or more of the total intensity. Because the percentages of the mixed sample in this case were unknown, Mr. Colman was able to assess the peak allele heights and determine which donor was the major contributor. In most cases if the allele heights are approximately 78 percent, they represent a major contributor. Because the minor contributor level was so low in this instance, Mr. Colman was unable to specify the donor. If both contributors had donated equal amounts of deoxyribonucleic acid to the sample, Mr. Colman would have been unable to identify a major contributor. By examining all of the 13 short tandem repeats loci with Profiler and COfiler plus the amelogenin gender determinative locus, Mr. Colman was able to determine higher peak heights that suggested Mr. Mathis was the major contributor. The trial court held: "As far as the PCR testing, I'm going to overrule [defense counsel's] objection. I do believe Kelly-Frye has been established to this court's satisfaction based on the evidence received from this witness and the transcripts that I have had a chance to read. [¶] Again, it's a difficult issue, but one of the things we have

to understand is that most people who are familiar with genetics are not in the relative scientific community. [¶] The scientific community, I believe, Mr. Colman testified is accepted for STR and PCR valances, and I find it satisfies Kelly-Frye from this court's standpoint." Following further explicative testimony by Mr. Colman regarding the major or minor contributor to a mixed stain sample, the trial court ruled that he could testify as to the higher mixture ratios to establish the probable identity of the major donor.

- ii. the trial court properly determined correct scientific procedures were employed

Mr. Colman testified that he followed not only the protocol and guidelines of the Los Angeles County Sheriff's Department Crime Laboratory, but also those of The Working Group on DNA Analysis Methods and the DNA Advisory Board and Perkin-Elmer, the manufacturer of Profiler and COfiler. People's exhibit No. 20 at the *Kelly* hearing was the user's manual for the AmpFLSTR® Profiler Plus PCR Amplification Kit, which explains: "The ability to obtain and compare quantitative values for the different allele peak heights on PE Applied Biosystems instruments provides additional valuable data to aid in resolving mixed genotypes. . . . [¶] [T]he likelihood that any sample is a mixture must be determined by the analyst in the context of each particular case, including the information provided from known reference samples." (AmpFLSTR® Profiler Plus™ PCR Amplification Kit User's Manual (1998) The Perkin-Elmer Corp., p. 9-25.) The manual further indicates that in normal, unmixed samples, the peak height ratios of less than 70 percent are rare. As a result, reamplification and analysis of additional loci may assist in the interpretation of the sample. (*Ibid.*) In this case, Mr. Colman compared the peak heights of the alleles at various loci in order to come to a conclusion regarding the major contributor. As he explained repeatedly: "I can't form hypothesis by looking at a piece of the puzzle. I have to look at all of it. . . . [¶] . . . [¶] As I said, my rule of thumb to do this is I look at the profile, and if I can't do that, if I'm faced with 4 other alleles of equal intensity, there's no way I can tell you who

the major is because I'd have to correlate those as alleles, and I can't do it. [¶] . . . [¶] [I]f it's an unknown mixture as in casework, I don't know the actual ratio of the 2 [contributors]. I can only deduce it from the peak height intensities." Ultimately, Mr. Colman concluded he assessed the major contributor based on a relative peak amplitude, exactly as the user's manual suggests.

Defendant further argues that Mr. Colman improperly utilized the "product rule" to calculate the frequency that Mr. Mathis's deoxyribonucleic acid profile would occur in the population. As the Attorney General points out, the National Research Council in its publication, *The Evaluation of Forensic DNA Evidence*, stated: "In many cases, one of the contributors—for example, the victim—is known, and the genetic profile of the unknown is readily inferred. In some cases, it might be possible to distinguish the genetic profiles of the contributors to a mixture . . . the analysis is similar to the unmixed case." (Nat. Research Council, *The Evaluation of Forensic DNA Evidence* (1996) p. 129; see Peo. Exh. No. 1, *Kelly* hearing.) As mentioned earlier, People's exhibit No. 41 at the *Kelly* hearing, an article published in *Forensic Science International*, concluded that the product rule across the 13 short tandem repeats loci utilized in AmpFLSTR Profiler Plus test kits and the Applied Biosystems Prism 310 Genetic Analyzer is valid for estimation of multilocus genotype frequencies for human identification applications in African-American and Caucasian databases. (Holt et al., *Practical Applications of Geotype Surveys for Forensic STR Testing*; *op. cit.*; pp. 5, 15-17.) In *People v. Soto*, *supra*, 21 Cal.4th at page 25, the California Supreme Court explained: "The final task is to calculate the statistical probability that the DNA profile of any one person, selected at random from the relevant population, would contain all the alleles represented by the measured bands of the evidentiary sample. The most straightforward means of making this calculation is through application of the 'product rule.' [¶] [¶] The essence of the product rule is the multiplication of individual band probabilities to arrive at an overall probability statistic expressed as a simple fraction, such as 1 in 100,000. The rule is applied in two stages: first, for determining the allelic frequency at each locus, and then for determining the alleles' combined frequency at all loci. [Fn. omitted.]" By utilizing

the product rule, Mr. Colman was able to determine that Mr. Mathis was the major contributor to the mixed sample based on the height of the alleles. Defendant's deoxyribonucleic acid contribution to the blood stain was so insignificant that his alleles were not detected at five of the 13 alleles. The trial court did not abuse its discretion in finding proper scientific procedures were followed.

h. harmless error

We agree with the Attorney General that even if the mixed sample deoxyribonucleic acid evidence was improperly admitted, any resultant error was harmless. It is not reasonably probable that defendant would have had a more favorable verdict absent the error. (*People v. Venegas, supra*, 18 Cal.4th at p. 93; *People v. Watson* (1956) 46 Cal.2d 818, 836.) Ms. Tresvant positively identified defendant as the individual she spoke to outside Mr. Mathis's home prior to the shooting. Ms. Tresvant also positively identified defendant as one of the six individuals that ran into Mr. Mathis's yard and engaged in the brutal assault. Christine positively identified defendant in a field identification, at the preliminary hearing, and at trial as the individual she saw standing over Mr. Mathis. Christine also testified defendant pointed a gun at Mr. Mathis. Defendant owned the white Monte Carlo that the assailants used to flee the shooting scene, was chased by police, and abandoned near the place he was later discovered.

B. Sufficiency of the Evidence of Reckless Indifference to Life Element of the Special Circumstance

Defendant argues that there was insufficient evidence that he acted with reckless indifference to human life as required to support the special circumstance finding that the murder of Mr. Mathis was committed in furtherance of the attempted first degree robbery in concert.

1. Murder committed while attempting to commit a robbery
special circumstance

Section 190.2, subdivision (a)(17)(A) provides for a special circumstance for first degree murder where: “The murder was committed while the defendant was engaged in, or was an accomplice in, the commission of, attempted commission of, or the immediate flight after committing, or attempting to commit [¶] . . . Robbery” Section 190.2 provides in pertinent part: “(c) Every person, not the actual killer, who, with the intent to kill, aids, abets, counsels, commands, induces, solicits, requests, or assists any actor in the commission of murder in the first degree shall be punished by death or imprisonment in the state prison for life without the possibility of parole if one or more of the special circumstances enumerated in subdivision (a) has been found to be true under Section 190.4. [¶] [E]very person, not the actual killer, who, with reckless indifference to human life and as a major participant, aids, abets, counsels, commands, induces, solicits, requests, or assists in the commission of a felony enumerated in paragraph (17) of subdivision (a) which results in the death of some person or persons, and who is found guilty of murder in the first degree therefor, shall be punished by death or imprisonment in the state prison for life without the possibility of parole if a special circumstance enumerated in paragraph (17) of subdivision (a) has been found to be true under Section 190.4.”

2. Standard of review

We view the evidence in a light most favorable to the judgment. (*Jackson v. Virginia, supra*, 443 U.S. at p. 319; *People v. Osband, supra*, 13 Cal.4th at p. 690; *Taylor v. Stainer, supra*, 31 F.3d at pp. 908-909.) The standard of review is the same in a determination of the sufficiency of the evidence to support a special circumstance finding. (*People v. Mayfield* (1997) 14 Cal.4th 668, 790-791; *People v. Green* (1980)

27 Cal.3d 1, 55, overruled on another point in *People v. Martinez* (1999) 20 Cal.4th 225, 241.) Our sole function is to determine if *any* rational trier of fact could have found the essential elements of the crime beyond a reasonable doubt. (*Jackson v. Virginia, supra*, 443 U.S. at p. 319; *People v. Bolin* (1998) 18 Cal.4th 297, 331; *People v. Marshall* (1997) 15 Cal.4th 1, 34; *People v. Ochoa* (1993) 6 Cal.4th 1199, 1206.) The California Supreme Court has held, “Reversal on this ground is unwarranted unless it appears ‘that upon no hypothesis whatever is there sufficient substantial evidence to support [the conviction].’” (*People v. Bolin, supra*, 18 Cal.4th at p. 331, quoting *People v. Redmond* (1969) 71 Cal.2d 745, 755.)

3. There is substantial evidence that defendant participated in the murder and the attempted robbery with reckless indifference to Mr. Mathis’s life

In *People v. Estrada* (1995) 11 Cal.4th 568, 577, the California Supreme Court described the reckless indifference special circumstance as follows: “We disagree and find that, when considered in its entirety-as the phrase is presented to the jury-‘reckless indifference to human life’ is commonly understood to mean that the defendant was subjectively aware that his or her participation in the felony involved a grave risk of death. The common meaning of the term ‘indifference,’ referring to ‘the state of being indifferent,’ is that which is ‘regarded as being of no significant importance or value.’ (Webster’s New Internat. Dict. (3d ed. 1981) p. 1151, col. 1.) To *regard* something, even to regard it as worthless, is to be aware of it. (See *id.* at p. 1911, col. 1 [‘regard’ is synonymous with ‘consider, evaluate, judge’].)” (See also *Tison v. Arizona* (1987) 481 U.S. 137, 158; *People v. Proby* (1998) 60 Cal.App.4th 922, 928 [fact that a co-defendant shot one of the victims where defendants were armed while robbing a McDonald’s and left the victim to die supported the finding that the murder was committed in furtherance of a robbery, the accused was a major participant, and acted with reckless indifference to human life]; *People v. Bustos* (1994) 23 Cal.App.4th 1747,

1753 [reckless indifference to human life demonstrated where an unarmed defendant accosted a woman in a public restroom to rob her, his co-defendant ran in and stabbed the victim, and the two fled leaving her to die].) In this case, there was substantial evidence to demonstrate defendant acted with others as a major participant in a robbery with reckless indifference to the life of Mr. Mathis, whom they attempted to rob. The evidence demonstrated that: defendant and as many as five other accomplices went to Mr. Mathis's house; they waited for Mr. Harris to leave; several of the men overwhelmed Mr. Mathis in his front yard, beat him with gardening tools and a table, kicked him, and held a gun to him; another accomplice went inside Mr. Mathis's home and demanded money from Ms. Lottie while holding a gun to her head; the man kicked Christine, who was pregnant, in the stomach; after Mr. Mathis was shot, the men ran to defendant's white Monte Carlo, which was parked nearby and fled the scene; and following a police car and foot pursuit, defendant was arrested near the area of his Monte Carlo. Blood was found on defendant's jeans and a T-shirt left on the fence by those fleeing his Monte Carlo. Deoxyribonucleic acid analysis revealed the blood stain was that of Mr. Mathis. Immediately after the crime occurred, Christine identified defendant as the individual who pointed a gun at Mr. Mathis. She also identified defendant at the preliminary hearing and at trial as the man who held the gun to Mr. Mathis. Defendant was also positively identified by Ms. Tresvant and the individual she spoke to outside Mr. Mathis's home prior to the shooting. Ms. Tresvant testified defendant was one of the individuals who began beating Mr. Mathis after Mr. Harris left.

C. Abstract of Judgment

Following our request for further briefing, the Attorney General argues the abstract of judgment should be corrected to more accurately reflect that defendant was sentenced to life *without* the possibility of parole. We agree. California Rules of Court, rule 12(c)(1) provides in pertinent part, “[O]n its own motion, the reviewing court may order correction . . . of any part of the record.” (See also *People v. Mitchell* (2001)

26 Cal.4th 181, 186-188.) As a general rule, the record will be harmonized when it is in conflict. (*People v. Smith* (1983) 33 Cal.3d 596, 599; *In re Evans* (1945) 70 Cal.App.2d 213, 216.) The Court of Appeal has held, “[A] discrepancy between the judgment as orally pronounced and as entered in the minutes is presumably the result of clerical error.” (*People v. Williams* (1980) 103 Cal.App.3d 507, 517, quoting the Los Angeles Superior Court Criminal Trial Judge’s Bench Book at page 452; see also § 1207; *In re Daoud* (1976) 16 Cal.3d 879, 882, fn. 1 [trial court could properly correct a clerical error in a minute order *nunc pro tunc* to conform to the oral order of that date if there was a discrepancy between the two].) The abstract of judgment does not accurately reflect the sentence imposed and must be corrected.

IV. DISPOSITION

The clerk of the superior court is directed to prepare and deliver to the Department of Corrections an amended abstract of judgment which accurately reflects defendant’s sentence of life without the possibility of parole. The judgment is affirmed in all other respects.

NOT TO BE PUBLISHED IN THE OFFICIAL REPORTS

TURNER, P.J.

We concur:

GRIGNON, J.

ARMSTRONG, J.