

SUPREME COURT OF ARIZONA
En Banc

STATE OF ARIZONA,)	
)	Supreme Court
)	No. CR-94-0168-AP
Appellee,)	
)	Yuma County
vs.)	No. C-19193
)	
BOBBY LEE TANKERSLEY,)	
)	
Appellant.)	O P I N I O N
)	
)	

Appeal from the Superior Court of Yuma County

The Honorable Thomas A. Thode

AFFIRMED

Grant Woods, Attorney General	Phoenix
By Paul J. McMurdie, Chief Counsel, Criminal Appeals	
Christopher E. Avery, Assistant Attorney General	
Attorneys for Appellee	

Richard D. Engler	
and	Yuma
M. Josephine Sotelo, Chief Deputy	
Yuma County Public Defender	Yuma
Attorneys for Appellant	

Z L A K E T, Chief Justice.

¶1 On November 18, 1991, police discovered the body of 65-year-old Thelma Younkin in her room at Yuma's Post Park Motel. She had been strangled, most likely by means of the oxygen tube she regularly used to assist her breathing. There were bite marks on her breasts and face, her right earlobe had been bitten off, and a

tooth was discovered beneath the body. The victim's vaginal area was extensively bruised and lacerated, and the medical examiner detected evidence of semen. Fecal matter was found on her legs, around the bathroom sink, and on a washcloth.

¶12 Defendant Bobby Lee Tankersley became a suspect early in the investigation. He lived at the same motel and was seen entering Thelma's room on the night of the murder. Police learned that the defendant had argued earlier that day with the victim's daughter, who warned him to leave her family alone. He allegedly replied, "I will get you before you get me." Immediately following discovery of the body, a police officer observed that the defendant was "rather buoyant and exhibiting laughter and exuberant behavior." He "was in a party mood" and "seemed to be nervous, pacing back and forth" -- conduct that the officer considered "inappropriate for the circumstances."

¶13 DNA (deoxyribonucleic acid) analysis established that Tankersley could not be eliminated as the source of a hair recovered from fecal matter on the sink. Additionally, a forensic odontologist testified it was "highly probable" that defendant had bitten the victim's left breast, and another said that his teeth "matched" the bite marks. Saliva with H antigens, of which the defendant is a secretor, was found in the bite wounds.

¶14 Following a jury trial, Tankersley was convicted of first degree murder and sexual assault. The trial judge sentenced him to

death for the homicide and to a consecutive aggravated term for the assault. Defendant appeals from both convictions and sentences. We have jurisdiction pursuant to Ariz. Const. art. VI, § 5(3); A.R.S. § 13-4031; Ariz. R. Crim. P. 26.15 and 31.2(b).

DNA EVIDENCE

¶15 Defendant challenges the admission of DNA evidence derived from polymerase chain reaction (PCR) testing. He does not attack the scientific theory of PCR, but rather its application to crime scene evidence. Defendant also asserts that the techniques and procedures used by the lab in this case are not generally accepted as capable of producing valid, reliable results. Finally, he questions whether the prosecution laid a proper foundation for the evidence.

¶16 PCR differs significantly from restriction fragment length polymorphis (RFLP), the technique approved in State v. Bible, 175 Ariz. 549, 577 & n.17, 858 P.2d 1152, 1180 & n.17 (1993), and used in State v. Boles, 188 Ariz. 129, 131-32, 933 P.2d 1197, 1199-2000 (1997); State v. Hummert, 188 Ariz. 119, 122-24, 933 P.2d 1187, 1190-92 (1997); and State v. Johnson, 186 Ariz. 329, 330, 922 P.2d 294, 295 (1996). Its admissibility is an issue of first impression for this court. A detailed description of the PCR technique can be found in George F. Sensabaugh & Cecilia von Beroldingen, The Polymerase Chain Reaction: Application to the Analysis of Biological Evidence, in Forensic DNA Technology 63-82

(Mark A. Farley & James J. Harrington eds. 1991). See also Kary B. Mullis, The Unusual Origin of the Polymerase Chain Reaction, Sci. Am., Apr. 1990, at 56. We attempt only a brief overview here to provide a foundation for our legal analysis.

¶7 PCR is a process for reproducing a short segment of DNA millions of times, making it possible to analyze minute or degraded samples. National Research Council, The Evaluation of Forensic DNA Evidence 69-70 (1996) [hereinafter 1996 NRC Report]. First, the extracted DNA is combined with a mixture of polymerase and "all of the building blocks necessary for DNA replication." Kamrin T. MacKnight, The Polymerase Chain Reaction (PCR): The Second Generation of DNA Analysis Methods Takes the Stand, 9 Santa Clara Computer & High Tech. L.J. 287, 305 (1993). The product is then heated in a "thermal cycler," which causes the double-stranded DNA to separate (denature) into two single strands (like splitting a ladder down the middle). Id.; see also Thomas M. Fleming, Annotation, Admissibility of DNA Identification Evidence, 84 A.L.R. 4th 313, 319 (1991). When the solution cools, primers¹ bind (anneal) to complementary base sequences² on the single-

¹ A primer "attaches to one end of a DNA fragment and provides a point for more complementary nucleotides to attach and replicate the DNA strand." Federal Judicial Center, Reference Manual on Scientific Evidence 326 (1994)[hereinafter Scientific Evidence].

² The DNA "ladder" is comprised of molecule pairs called "bases" -- adenine(A), cytosine(C), guanine(G), and thymine(T). Fleming, supra, at 319. G and C bind exclusively with each other, as do A and T. The order of these bases along the DNA

stranded templates. Sensabaugh & Von Beroldingen, supra, at 64. Next, polymerase starts the synthesis of new DNA strands (extension) by assembling nucleotide³ building blocks that are complementary to the template strands. MacKnight, supra, at 305. As a result, two double-stranded segments of DNA, identical to the original, are created. The process is repeated, and with each new cycle, the DNA doubles in size. Sensabaugh & Von Beroldingen, supra, at 64. Once a sufficient amount of the targeted DNA has been produced, a profile or typing can be done. Id. at 66.

¶18 PCR is only an amplification process and does not directly analyze DNA. To do that, a genetic marker typing test must be used. Id. The test employed in the present case was the AmpliType DQ-alpha kit by Cetus Corporation. This kit, in analyzing the DQ-alpha gene, had the capability of detecting six alleles, termed 1.1, 1.2, 1.3, 2, 3, and 4. P. Sean Walsh et al., Report of the Blind Trial of the Cetus AmpliType HLA Dq" Forensic Deoxyribonucleic Acid (DNA) Amplification and Typing Kit, 36 J. Forensic Sci. 1551, 1552 (1991). Each individual has two alleles that are either the same (e.g., 1.2, 1.2) or different (e.g., 1.2, 4). See People v. Lee, 537 N.W.2d 233, 250 (Mich. App. 1995),

molecule constitutes a genetic code. Mullis, supra, at 56. Each variation of a specific sequence or gene is called an "allele." Fleming, supra, at 319; Scientific Evidence, supra, at 323.

³ A nucleotide is a "unit of DNA consisting of a base (A, C, G, or T) and attached to a phosphate and a sugar group." Scientific Evidence, supra, at 326.

appeal denied, 554 N.W.2d 12 (Mich. 1996).

¶19 To identify a specimen's DQ-alpha profile, short DNA segments that detect specific alleles, called "probes," are fixed to a nylon membrane at a particular location. 1996 NRC Report, supra, at 71-72; see also Scientific Evidence, supra, at 327 (for definition of probe). The amplified DNA is again denatured and then flooded over the membrane. A chemical reaction occurs wherever the sample DNA finds its complementary probe, causing a blue dot to appear at that location. The positions of the dots indicate the specimen's DQ-alpha genotype. MacKnight, supra, at 306-07. This procedure is known as "reverse dot blotting." National Research Council, DNA Technology and Forensic Science 42 (1992) [hereinafter 1992 NRC Report].

¶10 Once this genotype is determined, it is compared to the DNA profile of the crime suspect. If the two are different, the person is excluded. If they "match," then the suspect is a possible source of the specimen, and questions arise regarding frequency of the genotype in the population.

¶11 In this case, hairs found on the bathroom sink and on a washcloth, as well as blood samples from the defendant and the victim, were sent to Forensic Science Associates (FSA) for PCR DQ-alpha testing. Of the hair samples, only a single strand had sufficient root material from which DNA could be extracted. Testing revealed that defendant's genotype was 1.1, 2, while the

victim's was 2, 4. The lab then determined that the hair's profile was 1.1, 2, thus eliminating the victim as a source but not excluding the defendant. Dr. Edward Blake, who owns and operates FSA, testified that 1.1, 2 occurs in about four percent of the Caucasian population.

¶12 Before trial, the court conducted an extensive Frye hearing, admitting more than eighty publications on PCR technology. The state called two witnesses: Dr. Blake and Dr. Helentjaris, a plant DNA expert at the University of Arizona. Three defense experts, Drs. Grunbaum, Gerdes, and Riley, testified about PCR analysis, FSA's laboratory procedures, and the testing done in this case. At the close of the hearing, the court found that the DNA evidence was admissible, stating that the defense's real complaint was of "dirty test tubes," not reliability of the methodology. In the trial court's view, any problem with FSA's procedures could be explained to the jury, which would then assess its impact.

Standard for Admissibility of New Scientific Evidence

¶13 Although not raised below, the state asks this court to abandon the Frye test in favor of the current federal standard for determining the admissibility of new scientific evidence. See Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, 589, 113 S. Ct. 2786, 2793 (1993) (holding that United States v. Frye, 293 F. 1013 (D.C. Cir. 1923), was superseded by the Federal Rules of Evidence). We decline to do so. In Johnson, 186 Ariz. at 331, 922

P.2d at 296, we reaffirmed our adherence to Frye. See also Bible, 175 Ariz. at 578-80, 858 P.2d at 1181-83. Moreover, in light of the prosecution's failure below to request application of the Daubert decision, the issue is not properly before us.

¶14 The state also argues that if Frye is preserved, it should govern only general principles such as "the variability of human DNA and its replication via a polymerase chain reaction," not the forensic application of PCR or specific techniques used in implementing this technology. We disagree. The following excerpt from the National Research Council's 1992 report is instructive:

"DNA typing" is a catch-all term for a wide range of methods for studying genetic variations. Each method has its own advantages and limitations, and each is at a different state of technical development. Each DNA typing method involves three steps:

1. Laboratory analysis of samples to determine their genetic-marker types at multiple sites of potential variation.
2. Comparison of the genetic-marker types of the samples to determine whether the types match and thus whether the samples could have come from the same source.
3. If the types match, statistical analysis of the population frequency of the types to determine the probability that such a match might have been observed by chance in a comparison of samples from different persons.

Before any particular DNA typing method is used for forensic purposes, it is essential that precise and scientifically reliable procedures be established for performing all three steps. . . .

There is no scientific dispute about the validity of the general principles underlying DNA typing: scientists agree that DNA varies substantially among humans, that variation can be detected in the laboratory, and that DNA comparison can provide a basis for distinguishing samples from different persons. However, a given DNA typing

method might or might not be scientifically appropriate for forensic use. Before a method can be accepted as valid for forensic use, it must be rigorously characterized in both research and forensic settings to determine the circumstances under which it will and will not yield reliable results. It is meaningless to speak of the reliability of DNA typing in general--i.e., without specifying a particular method.

1992 NRC Report, supra, at 51 (emphasis added). Arizona's application of Frye has historically required general acceptance of both a scientific principle and the technique applying it. See State v. Superior Court, 149 Ariz. 269, 277, 718 P.2d 171, 179 (1986); Bible, 175 Ariz. at 581-82, 858 P.2d at 1184-85 (finding general acceptance of Cellmark's procedures for declaring an RFLP DNA match). We see no reason to depart from this approach.

¶15 In the present case, PCR amplification and DQ-alpha testing must each be generally accepted as capable of producing valid, reliable results. We review the trial court's Frye findings de novo. Bible, 175 Ariz. at 578, 858 P.2d at 1181.

PCR DQ-Alpha Analysis of Crime Scene Samples

¶16 Defendant concedes that PCR DQ-alpha analysis is accepted as reliable for medical and biological research in the general scientific community. He says, however, that the same is not true of its application to crime scene evidence. He claims that PCR testing in this context is inherently unreliable because the samples are often recovered under imperfect conditions. As a result, contaminated DNA may be inadvertently amplified, completely masking the specimen's true DNA. Such contamination could come

from the victim, bystanders, the analyst, or amplified DNA previously processed within the lab. See 1992 NRC Report, supra, at 65-67 (discussing possible sources of contamination). All of the defendant's experts testified that PCR DQ-alpha testing is inappropriate for crime scene analysis.

¶17 The state, however, presented significant evidence to the contrary. This included reports of blind testing and proficiency exams, as well as scientific articles describing accurate typing of mixed samples and degraded specimens. See, e.g., Walsh, supra, at 1554; MacKnight, supra, at 344-48. See also Catherine Theisen Comey et al., PCR Amplification and Typing of the HLA Dq" Gene in Forensic Samples, 38 J. Forensic Sci. 239 (1993); Catherine Theisen Comey & Bruce Budowle, Validation Studies on the Analysis of the HLA Dq" Locus Using the Polymerase Chain Reaction, 36 J. Forensic Sci. 1633 (1991).

¶18 The Frye test does not require unanimity among scientists. State v. Velasco, 165 Ariz. 480, 486, 799 P.2d 821, 827 (1990). It is true that contamination is of particular concern in any procedure that uses PCR. See 1996 NRC Report, supra, at 71 ("The amplification process is so efficient that a few stray molecules of contaminating DNA can be amplified along with the intended DNA."). This risk, however, has not rendered PCR-based techniques unacceptable by the scientific community. In fact, erroneous amplification is far more likely to result in the false

exclusion, not inclusion, of a suspect. Id. Moreover, the possibility of contamination "may present an open field for cross-examination." State v. Lyons, 924 P.2d 802, 813 (Or. 1996); see also People v. Pope, 672 N.E.2d 1321, 1326 (Ill. App. Ct. 1996), appeal denied, 677 N.E.2d 970 (Ill. 1997). The overwhelming consensus among scientists is that so long as proper procedures are followed, the results should be reliable. 1996 NRC Report, supra, at 23; 1992 NRC Report, supra, at 145-46. See also State v. Moeller, 548 N.W.2d 465, 482-83 (S.D. 1996); Lee, 537 N.W.2d at 257.

¶19 Numerous other courts have found PCR DQ-alpha analysis admissible under the Frye standard. See Seritt v. State, 647 So. 2d 1, 4 (Ala. Crim. App. 1994); Harmon v. State, 908 P.2d 434, 442 (Alaska Ct. App. 1995); People v. Morganti, 50 Cal. Rptr. 2d 837, 853 (Cal. Ct. App. 1996); Pope, 672 N.E.2d at 1327; State v. Hill, 895 P.2d 1238, 1247 (Kan. 1995); Lee, 537 N.W.2d at 257; State v. Williams, 599 A.2d 960, 968 (N.J. Super. Ct. Law Div. 1991); State v. Russell, 882 P.2d 747, 768 (Wash. 1994). We agree with the trial court here that PCR technology is generally accepted within the relevant scientific community for use on crime scene evidence. Furthermore, we observe that the DQ-alpha marker system is a generally accepted means of distinguishing DNA. See Russell, 882 P.2d at 768.

FSA's Techniques and Procedures

¶20 Defendant argues that FSA's procedures for amplifying and analyzing the DQ-alpha gene are not generally accepted. He points to an array of allegedly improper practices: a lack of written protocols and current proficiency testing, an excessive number of cycles run on the thermal cycler, temperature regulation problems, the failure to quantify the sample's DNA before amplification, and the reporting of results despite evidence of contamination.

¶21 We note at the outset that most of defendant's claims challenge FSA's implementation of PCR DQ-alpha testing, not the validity or reliability of the technique itself. Because such questions relate to the correctness of procedures followed in a given case, and hence the reliability of particular results, they are foundational considerations governed by ordinary evidentiary standards. See State ex rel. Collins v. Superior Court, 132 Ariz. 180, 196, 644 P.2d 1266, 1282 (1982) (Once Frye is satisfied, scientific evidence is admissible "subject to a foundational showing that the expert was qualified, the technique was properly used, and the results were accurately recorded."); Ariz. R. Evid. 702, 703 & 403; see also 1992 NRC Report, supra, at 23 ("The adequacy of the method used to acquire and analyze samples in a given case bears on the admissibility of the evidence and should, unless stipulated by opposing parties, be adjudicated case by case."). If, for example, testing procedures are so seriously flawed that the results are rendered unreliable, the trial court

should not admit the evidence. See Russell, 882 P.2d at 766-67. Once an adequate foundation is established, however, complaints of laboratory error or incompetence are considered by the trier of fact in assessing the weight of the evidence. See, e.g., State v. Murray, 184 Ariz. 9, 30, 906 P.2d 542, 563 (1995) (expert's failure to follow FBI procedures in preserving and analyzing footprint evidence goes to weight rather than admissibility); State v. Moore, 885 P.2d 457, 471-75 (Mont. 1994), disapproved on other grounds by State v. Gollehon, 906 P.2d 697, 700-01 (Mont. 1995).

¶122 Defendant suggests that strict compliance with guidelines developed by the Technical Working Group on DNA Analysis and Methods (TWGDAM) should be a prerequisite for admitting any lab's test results. He relies heavily on the NRC's recommendation that laboratories adhere to TWGDAM standards. See 1992 NRC Report, supra, at 98-99. While we agree that such conformity might aid trial courts in determining whether an adequate foundational showing has been made, these guidelines are not mandatory. See id. at 99. Similarly, certification by the Laboratory Accreditation Board of the American Association of Crime Laboratory Directors could arguably provide a useful gauge of reliability, see 1996 NRC Report, supra, at 77, but it is not required. The appropriate inquiry is whether a lab's techniques have deviated so far from generally accepted practices that the test results cannot be accepted as reliable.

¶23 In this case, the prosecution presented its foundational evidence during the Frye hearing. See Bible, 175 Ariz. at 581, 858 P.2d at 1184 (trial court has discretion in deciding whether foundational showing is to be made outside jury's presence). The court found all of the expert witnesses qualified and determined that the test in question complied sufficiently with the protocols of FSA, other labs, and the kit's manufacturer, Cetus. The judge also concluded that Dr. Blake had recorded the results. These factual findings will not be disturbed absent an abuse of discretion. See State v. Gentry, 888 P.2d 1105, 1118 (Wash. 1995). As discussed below, we find that the trial judge did not abuse his discretion in admitting the test results. See also Hill, 895 P.2d at 1246-47 (approving FSA's methods); Lee, 537 N.W.2d at 258 (same); State v. Dishon, 687 A.2d 1074, 1087 (N.J. Super. Ct. App. Div. 1997) (same), certification denied, 693 A.2d 112 (N.J. 1997); Moeller, 548 N.W.2d at 483-84 (same).

Protocols and Proficiency Testing

¶24 FSA's protocols for quality assurance, decontamination, and evaluation of results were not written out as recommended by the TWGDAM. Defendant claims that this omission prevented other scientists from reviewing the lab's methodology. At the Frye hearing, however, Dr. Blake detailed the procedures that he and his assistant followed in conducting the analysis and controlling for contamination. Moreover, although TWGDAM guidelines advocate

annual proficiency testing, the fact that FSA had not participated in such a test for more than two years does not necessarily render its results unreliable, as the defendant asserts. See 1996 NRC Report, supra, at 185 ("[P]roficiency-testing . . . bears on the weight that should be accorded forensic test results."). Defendant's experts were free to challenge FSA's techniques.

Number of Amplification Cycles

¶125 Defendant alleges that FSA's use of thirty-five amplification cycles in the thermal cycler departs significantly from generally accepted practices and renders the results unreliable. He points to the Cetus User Guide and protocols from several other labs, all of which advocate thirty-two. We cannot say that the use of thirty-five cycles is a deviation that should have precluded admission of the data. See 1996 NRC Report, supra, at 69 ("This [PCR] three-step cycle is repeated, usually 20-35 times.").

Temperature During Denaturation

¶126 Regulation of the temperature within the thermal cycler is critical for successful amplification. FSA's calibration records revealed prior instances in which temperatures had fluctuated outside of recommended ranges. Defendant, however, makes no claim that this occurred here. Past difficulties with the thermal cycler are issues that affect weight, not admissibility. See Moore, 885 P.2d at 471-72.

Quantification of DNA

¶127 Defendant challenges FSA's failure to quantify the extracted DNA prior to amplifying it. Most scientists agree that quantification should be done to ensure that a sufficient amount of DNA is available for testing. Dr. Blake testified that although he normally quantifies before amplification, he does not do so on DNA extracted from a single hair. This is because the measuring process would consume half of the sample, leaving nothing for repeat testing, which is itself an important safeguard. See id. at 473. In our view, the failure to quantify did not render the results inadmissible.

Contamination

¶128 During amplification, FSA used numerous controls to test for contamination. One of them, a sample run without any added DNA, showed a faint blue dot. Defendant argues that the final results should not have been admitted because this was evidence of contamination. He points to several other labs' protocols, which state that testing should be considered inconclusive if a control appears positive. Dr. Blake, however, testified that what appeared here was "a barely detectable trace material that is too weak to clearly type." In his view, it was not significant since all of the other controls were negative. Dr. Helentjaris agreed, stating that the faint dot "wouldn't be evaluated by somebody in the field . . . as a positive result." Rather, it was "simply a trace

signal." At the conclusion of the hearing, the trial court found that there was "no sufficient showing of contamination." This finding is amply supported by the record. The court did not abuse its discretion.

DISCOVERY ISSUE

¶129 The defense requested FSA's typing strip photos and amplification sheets for tests run immediately before and after those in this case. This material was necessary, defendant claimed, to fully evaluate possible contamination in Dr. Blake's lab. He later expanded the request to include every DQ-alpha case analyzed by FSA that had been incorporated into its population database, contending that if there had been contamination in any of those tests, Dr. Blake's frequencies would be flawed.

¶130 After extensive briefing and oral argument, the trial judge denied the defendant's discovery motion. He found that the request was burdensome and irrelevant since FSA's samples contributed to only one portion of the entire database used by Dr. Blake when calculating the frequencies. Moreover, based on evidence presented during the Frye hearing, the trial court noted that Dr. Blake's population data compared favorably to frequencies that would be expected under an assumption of Hardy-Weinberg equilibrium.⁴

⁴ The Hardy-Weinberg principle predicts the frequency of a genotype, assuming a large, randomly-mating population without selection, migration, and mutation. 1992 NRC Report, supra, at

¶131 In an effort to establish substantial need for the raw data, the defense also asserted "lack of veracity" in Dr. Blake's previous reporting. The court, however, found no basis for this contention. We review the court's ruling for an abuse of discretion. See State v. Piper, 113 Ariz. 390, 392, 555 P.2d 636, 638 (1976); Ariz. R. Crim. P. 15.1(e).

¶132 To warrant disclosure, the defendant must show both "substantial need" for the requested information and that he "is unable without undue hardship to obtain the substantial equivalent by other means." Id. The trial court may consider if compliance with a discovery order "would be unreasonable or oppressive." Id.

¶133 Here, each side presented a very different picture of the consequences of disclosure. The state claimed that compliance with defendant's request would be extremely burdensome, taking over 500 hours to complete and causing Dr. Blake to close down his laboratory. Defense counsel, on the other hand, contended that she had been to the lab and would need less than a day to copy everything that she had seen. Alternatively, she suggested that a defense expert could be appointed to conduct an in-house review during which selected documents would be copied.

¶134 Likewise, each side had its own version of the material's

169. Dr. Blake, the state's expert, testified that it is often used to check population data for potential problems by comparing the observed frequencies to those expected under an assumption of Hardy-Weinberg equilibrium.

availability elsewhere. The state believed that the defense had access to this information from other sources, including published data and documents previously received from various laboratories. Defendant, however, argued that the disclosure from other labs related to RFLP, not PCR. Furthermore, the publications would not be sufficient because Dr. Blake had extensively added to his database after the studies were released.

¶135 We note that the 1992 NRC Report emphasizes the importance of complete and open disclosure. See 1992 NRC Report, supra, at 132, 148 ("All materials relied on by prosecution experts must be available to defense experts, and vice versa. . . . Protective orders should not be used to prevent experts on either side from obtaining all relevant information, which can include original materials, data sheets, software protocols, and information about unpublished databanks."). Similarly, there are no scientific grounds for withholding information in the discovery process. 1996 NRC Report, supra, at 167. Nevertheless, the trial judge was in the best position to rule on the defendant's request and had the discretion to do so. "Something is discretionary because it is based on an assessment of conflicting procedural, factual or equitable considerations which vary from case to case and which can be better determined or resolved by the trial judge, who has a more immediate grasp of all the facts of the case, an opportunity to see the parties, lawyers and witnesses, and who can

better assess the impact of what occurs before him." State v. Chapple, 135 Ariz. 281, 297 n.18, 660 P.2d 1208, 1224 n.18 (1983).

¶136 In the present case, almost four months had passed between defendant's initial discovery request and the court's final ruling on the matter. During this time, the trial judge heard and considered arguments from both sides. He ultimately determined that the defendant had not met the requirements of Rule 15.1(e), and consequently was not entitled to the material that he sought. We cannot say that the judge abused his discretion.

EVIDENCE OF ALTERNATIVE SUSPECTS

Kenneth Tyman

¶137 Defendant claims it was error to exclude evidence that Kenneth Tyman may have committed the murder. He sought to introduce the following: (1) that Tyman had previously rented the room later occupied by the victim and was seen with a key to that room weeks after the murder (which he denied); (2) that he lived near the motel in a tent where female undergarments soiled with feces had been found; (3) that he had been convicted of sexual assault more than ten years prior to the murder, was required to register as a convicted sex offender, had seen a psychologist concerning sex problems, and possessed pornographic materials after the murder; and (4) that there was circumstantial evidence linking Tyman to the murder of his wife, who had been strangled in Show Low two years earlier and was about the same age as the victim here.

The trial court admitted evidence regarding the room key and the stained underwear, but excluded Tyman's sexual history and the Show Low murder based on Arizona Rules of Evidence 403 and 404(b). We review the admission or exclusion of evidence for abuse of discretion. State v. Robinson, 165 Ariz. 51, 56, 796 P.2d 853, 858 (1990).

¶138 A defendant is permitted to show that another person committed the crime for which he was charged. State v. Oliver, 169 Ariz. 589, 590, 821 P.2d 250, 251 (App. 1991). It is, however, within the trial court's sound discretion to exclude such evidence if "it simply affords a possible ground of suspicion against another." Id. at 591, 821 P.2d at 252. To gain admission, "[t]he defendant must show that the evidence has an inherent tendency to connect the other person with the actual commission of the crime." Id.

¶139 Rule 404(b) creates an exception to the ban on character evidence when "other crimes, wrongs, or acts" are offered for a relevant purpose other than propensity. State v. Hughes, 189 Ariz. 62, 68, 938 P.2d 457, 463 (1997). This rule applies to other acts of third persons as well as to those of defendants. See United States v. McCourt, 925 F.2d 1229, 1236 (9th Cir. 1991).

¶140 The defense asserts that the Show Low incident was offered to suggest that Tyman, not defendant, murdered the victim in this case. "To establish identity based on other acts, 'the

modus operandi of and the circumstances surrounding the two crimes must be sufficiently similar as to be like a signature.'" Hughes, 189 Ariz. at 68, 938 P.2d at 463 (quoting State v. Jackson, 186 Ariz. 20, 27, 918 P.2d 1038, 1045 (1996), cert. denied, 117 S. Ct. 527 (1996)). Although the details need not be identical, there must be similarities between important aspects where one would normally expect to find differences. See State v. Roscoe, 145 Ariz. 212, 217, 700 P.2d 1312, 1317 (1984). Even if we assume that it was Tyman who committed the Show Low murder, the parallels between the two crimes are not "sufficiently similar as to be like a signature." The only likenesses we can ascertain are that both victims were strangled and were approximately the same age. This is not enough. See Hughes, 189 Ariz. at 68, 938 P.2d at 463 (concluding insufficient similarities where both victims were women who had angered defendant, and the same person may have been paid to commit the crimes); cf. State v. Harding, 137 Ariz. 278, 289-90, 670 P.2d 383, 394-95 (1983) (finding striking similarities where both victims had stayed at hotels, were similarly hog-tied and gagged, and had personal items and vehicles stolen). Moreover, there are notable differences between the two crimes. Unlike the present case, the Show Low murder included no evidence of ligature strangulation, bite marks, or sexual assault. See State v. Stuard, 176 Ariz. 589, 597-98, 863 P.2d 881, 889-90 (1993) (examining differences as well as similarities among the crimes).

¶41 Even if we assume, arguendo, that the evidence would be admissible under Rule 404(b), it may nevertheless "be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Ariz. R. Evid. 403; see United States v. Perkins, 937 F.2d 1397, 1401 (9th Cir. 1991). Charges were never brought against Tyman for the Show Low murder. Thus, any discussion of it would likely have resulted in a trial within a trial. Under such circumstances, the minimal probative value of the evidence was substantially outweighed by its potential for unfair prejudice, jury confusion, and unnecessary delay. The trial judge's ruling under Rule 403 was not a clear abuse of discretion. See Williams, 133 Ariz. at 231, 650 P.2d at 1213.

¶42 The trial court also excluded Tyman's ten-year-old sexual assault conviction and evidence of his alleged "perverse sexual propensities." The judge found that the conviction was too remote in time and not sufficiently similar to the instant crime to be relevant.⁵ We agree. Tyman's conviction was for molesting his own daughters. Any similarity between that conduct and the assault in the present case is tenuous at best. More importantly, ten years

⁵ Ariz. R. Evid. 404(c) regarding character evidence in sexual misconduct cases did not become effective until December 1, 1997, and thus was not applicable at the time of defendant's trial.

is too distant in time to be of much probative value. See Roscoe, 145 Ariz. at 217, 700 P.2d at 1317.

¶43 Finally, evidence presented at trial established that Tyman had no teeth and that his dentures had been destroyed in a fire years before the murder. Expert testimony demonstrated that the bite marks found on the victim's body could not have been made by someone without teeth or with dentures. For all of the foregoing reasons, we conclude the trial court was correct in excluding alternative suspect evidence involving Kenneth Tyman.

Torii Thompson

¶44 Defendant argues that it was error to exclude evidence of alternative suspect Torii Thompson. Apparently, Thompson had sued the victim, Thelma Younkin, for \$50 in small claims court. He also had an unsatisfied judgment against a Christine Bauer for \$2,000. Shortly after the Younkin murder, Thompson sent a letter to Bauer that stated, "Christine, this is the year for me to settle up with all who have fucked over me. See you soon, Torii." A newsclipping of the Younkin murder and a copy of the lawsuit that Thompson had filed against Younkin were attached to the letter. Because Thompson was unavailable -- neither the defense nor the state could locate him -- defendant wanted Bauer to testify regarding the letter as a statement against Thompson's penal interest. See Ariz. R. Evid. 804(b)(3). The trial judge excluded this evidence, finding that there was nothing to corroborate the trustworthiness

of the implied admission that Thompson killed Younkin. The court further noted that the statement was made with a monetary interest, which weighed against its reliability.

¶45 We clarified the requirements of Rule 804(b)(3) in State v. LaGrand, 153 Ariz. 21, 26-29, 734 P.2d 563, 568-71 (1987). For a statement to be admissible under the rule, the declarant must be unavailable, the statement must be against the declarant's interest, and there must be corroborating circumstances that "clearly indicate the trustworthiness of the exculpatory statement." Id. Many factors are involved in determining trustworthiness, including: the existence of supporting and contradictory evidence, the relationship between the declarant and the listener, the relationship between the declarant and the defendant, the number of times the statement was made, the length of time between the event and the statement, the psychological and physical environment at the time of the statement, and whether the declarant would benefit from the statement. See id. at 27-28, 734 P.2d at 569-70.

¶46 The first requirement of admissibility, that the declarant be unavailable, is met here. Likewise, the second qualification, that the statement be against the declarant's interest, is satisfied. The rule does not require a direct confession of guilt. See id. at 27, 734 P.2d at 569. "'Rather, by referring to statements that "tend" to subject the declarant to

criminal liability, the Rule encompasses disserving statements by a declarant that would have probative value in a trial against the declarant.'" Id. (quoting United States v. Thomas, 571 F.2d 285, 288 (5th Cir. 1978)). In the present case, Thompson did not make a direct confession of guilt. Instead, his letter to Bauer suggested that he killed Younkin. Because this implied statement would tend to subject Thompson to criminal liability, it meets the second requirement.

¶47 The corroborating evidence requirement, however, is not satisfied. No further evidence links Thompson to the Younkin murder. On the other hand, there is ample contradictory evidence, for example, the eye-witness who saw defendant enter Younkin's room, the DNA evidence, the bite-mark evidence, and the absence of any witness placing Thompson near the area. The statement was made only once. See id. at 28, 734 P.2d at 570 ("The number of times the statement is made and the consistency of multiple statements may assist in determining trustworthiness."). More importantly, Thompson likely made it as an attempt to collect on a debt. That he would benefit from the statement makes it less reliable. See id. We agree with the trial judge that this evidence did not meet the requirements of Rule 804(b)(3). There was no abuse of discretion in excluding it.

¶48 On appeal, the defendant argues that the Show Low material is admissible as a public record. See Ariz. R. Evid.

803(8). Because he did not assert this argument in the trial court, however, the issue is waived. See McCormick on Evidence § 51, at 199 n.17 (4th ed. 1992) ("[I]f a specific ground for admission is claimed in the offer of proof but is not applicable and the judge excludes the evidence, the proponent cannot complain if there was another ground for admission.").

WUSSLER INSTRUCTION

¶149 Defendant challenges the lesser-included jury instruction approved in State v. Wussler, 139 Ariz. 428, 430, 679 P.2d 74, 76 (1984), which requires jurors to acquit on a charged offense before considering anything less. He argues that Wussler should be overruled in favor of a "reasonable efforts" instruction. Such a change was recently adopted in State v. LeBlanc, 186 Ariz. 437, 438, 924 P.2d 441, 442 (1996). That opinion, however, specifically held that it would apply only prospectively. Id. at 440, 924 P.2d at 444. The giving of a Wussler-type instruction here was not error.

LATE NOTICE OF INTENT TO SEEK THE DEATH PENALTY

¶150 The state notified defendant of its intent to seek the death penalty one day late. See Ariz. R. Crim. P. 15.1(g)(1) (requiring notice within 30 days of arraignment). Defendant claims that this delay deprived the trial court of jurisdiction to impose a capital sentence. We have held otherwise. Barrs v. Wilkinson, 186 Ariz. 514, 515, 924 P.2d 1033, 1034 (1996); Jackson, 186 Ariz.

at 24, 918 P.2d at 1042.

PENALTY PHASE

¶151 Defendant raises no sentencing issues. Nevertheless, we must independently review the aggravating and mitigating factors to determine if death is an appropriate penalty. See A.R.S. § 13-703.01(A).

¶152 The trial judge found that the murder was committed in an especially heinous, cruel, or depraved manner. A.R.S. § 13-703(F)(6). In finding both prongs of this aggravating factor, the court observed the following:

The defendant was a healthy male of good physical ability and strength, while the victim was an aged female, ill and infirm, of gentle disposition, and wholly at his mercy.

The victim was strangled, apparently by her own oxygen tubes, and suffered a painful and frightening death.

The victim was physically and sexually assaulted by the defendant while still alive or while at the point of death.

The defendant chewed off parts of the victim's flesh while the victim was still alive.

The victim suffered great pain inflicted by the defendant.

The defendant caused feces to be smeared on the victim's body.

The defendant bit and chewed the victim's living flesh repeated times.

The victim offered no threat, meanness, or harm to the defendant and offered only the neighborly friendship of a frail, little old lady.

¶153 We agree that this murder was committed in an especially heinous and depraved manner. The victim was clearly helpless, the killing was senseless, and there is evidence of both needless

mutilation to the victim's body and gratuitous violence. See State v. Gretzler, 135 Ariz. 42, 52, 659 P.2d 1, 11 (1983). We thus uphold the (F)(6) aggravating factor on this basis and need not determine whether cruelty also exists. See State v. West, 176 Ariz. 432, 448, 862 P.2d 192, 208 (1993).

¶154 In mitigation, the trial court found that, even though the defendant's alcohol intoxication on the night of the murder may have caused some degree of impairment, his ability to appreciate the wrongfulness of his conduct or to conform his conduct to the law's requirements was not significantly impaired. See A.R.S. § 13-703(G)(1). The court also considered evidence of defendant's history of substance abuse, good behavior during previous incarcerations, loving relationships with some family members, potential for rehabilitation, and dysfunctional upbringing. In conducting our independent review, we find, as did the trial judge, that the proven mitigation is not sufficiently substantial to call for leniency.

DISPOSITION

¶155 Defendant's convictions and sentences are affirmed.

THOMAS A. ZLAKET, Chief Justice

CONCURRING:

STANLEY G. FELDMAN, Justice

JAMES MOELLER, Justice

FREDERICK J. MARTONE, Justice

EINO M. JACOBSON, Judge (Retired)

Justice Robert J. Corcoran (Retired) did not participate in the determination of this matter. Pursuant to Ariz. Const. art. VI, § 3, the Honorable Eino M. Jacobson, Judge (Retired) of the Arizona Court of Appeals, Division One, was designated to sit in his stead.