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BY  COURT

1 **FOR PUBLICATION**

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3
4 **IN THE SUPERIOR COURT**
5 **FOR THE**
6 **COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS**

6 **COMMONWEALTH OF THE**
7 **NORTHERN MARIANA ISLANDS,**

8 **Plaintiff,**

9 **v.**

10 **JOSEPH A. CRISOSTOMO,**

11 **Defendant.**

) **CRIM. CASE NO. 13-0049**
)
)

) **ORDER GRANTING IN PART MOTION**
) **TO EXCLUDE MITOCHONDRIAL DNA**
) **TEST RESULTS AND EXPERT**
) **TESTIMONY**
)
)
)

12 **I. INTRODUCTION**

13 This matter was heard on February 18, 2014 at 8:30 a.m. and 3:00 p.m. and February 21,
14 2014 at 9:00 a.m. in Courtroom 220A on the Defendant's motion. Defendant Joseph A. Crisostomo
15 was present and represented by Janet King. The Commonwealth was represented by Chief
16 Prosecutor Brian Flaherty and Assistant Attorney General Margo Badawy.

17 On August 23, 2013 Defendant Crisostomo filed a motion to preclude mitochondrial DNA
18 test results and a request for *Daubert* hearing. The Commonwealth filed an opposition to the motion
19 on September 4, 2013, and Defendant Crisostomo filed a reply on September 9, 2013. The Court
20 granted Defendant's request for a *Daubert* hearing on September 30, 2013. The *Daubert* hearing
21 was held on February 18 and 21, 2014.

22 Based on a review of the filings, the evidence presented at the hearing, and applicable law,
23 the Court grants in part the Defendant's motion to exclude the mitochondrial DNA test results and
24 expert testimony about those results under Rule 702 of the Commonwealth Rules of Evidence.

AGU
J. King

1 **II. FACTUAL AND PROCEDURAL BACKGROUND**

2 Defendant Crisostomo has been charged with First Degree Murder in violation of 6 CMC
3 §§ 1101(a)(1) and (3); Kidnapping, in violation of 6 CMC § 1421(a)(2)(B); Sexual Assault in the
4 First Degree, in violation of 6 CMC § 1301(a)(1); Robbery, in violation of 6 CMC § 1411(a);
5 Theft, in violation of § 1601(a); Assault and Battery, in violation of 6 CMC § 1202(a); and
6 Disturbing the Peace, in violation of 6 CMC § 3101(a).

7 The Commonwealth asserts that the alleged victim, Emerita Romero, was in a car driven by
8 Defendant Crisostomo on the night that she died. The Commonwealth recovered a hair from that
9 car, and asked Federal Bureau of Investigation (“FBI”) to compare the mitochondrial DNA from
10 that hair sample to known samples of the alleged victim and the Defendant. This analysis was
11 performed by FBI Forensic Examiner Lara Adams who prepared a report containing the results of
12 the comparison (the “FBI report”). Ms. Adams concluded that the Defendant could be excluded as
13 the source of the hair recovered from the car, but that the alleged victim, Ms. Romero, could not be
14 excluded as the source of the hair recovered from the car. In the FBI report, Ms. Adams also
15 provided a statistical analysis to give meaning to the “cannot exclude” conclusion. The statistical
16 analysis involves comparing the mitochondrial DNA sequence present in the hair to sequences
17 observed in a mitochondrial DNA database to determine the highest percentage of the population
18 that could be expected to have that particular mitochondrial DNA sequence.

19 Defendant moves to exclude the testimony of Ms. Adams and the results of the
20 mitochondrial DNA analysis she provided. The Defendant argues that due to limitations of the
21 FBI’s mitochondrial DNA database (“CODIS”), the statistical analysis provided is not reliable in
22 this case, and therefore, the mitochondrial DNA results should be excluded under Rule 702 of the
23 Commonwealth Rules of Evidence (“Rule 702”). Alternatively, Defendant argues that even if found
24 to be reliable under Rule 702, Ms. Adams’ testimony should be excluded under Rule 403 of the

1 Commonwealth Rules of Evidence because, due to the deficiencies in the statistical analysis and the
2 heightened weight that jurors afford to scientific experts, the testimony's probative value is
3 outweighed by the risk of misleading the jury.

4 The Commonwealth argues that the statistical analysis should not bear on the admissibility
5 of the evidence under Rule 702. The Commonwealth argues that it is only the results of the
6 mitochondrial DNA comparison, whether or not the known sample matches the unknown, that
7 should be considered under Rule 702 and the statistical analysis merely goes to the weight of the
8 conclusion, not its reliability.

9 In the hearing on February 18 and 21, 2014, the Court heard extensive testimony from Ms.
10 Adams concerning her scientific and technical expertise and the procedures and methodologies she
11 applied in this case. Following Ms. Adams' testimony, the Commonwealth moved to certify her as
12 an expert pursuant to Rule 702.

13 **III. DISCUSSION**

14 **A. Mitochondrial DNA Sequencing Analysis**

15 Mitochondrial DNA sequencing analysis involves genetics, chemistry, molecular biology
16 and statistics. *See Gov't of V.I. v. Byers*, 941 F. Supp. 513, 525 (D.V.I. 1996). Human cells contain
17 two types of DNA: nuclear DNA, two copies of which are found within the nucleus of each cell,
18 and mitochondrial DNA, found in the mitochondria. Each cell has thousands of mitochondria, and
19 thousands of copies of mitochondrial DNA. Mitochondrial DNA is inherited from only the mother,
20 and is shared between relatives who have the same maternal lineage. This means that mitochondrial
21 DNA is not a unique identifier. A person has the same mitochondrial DNA as his or her mother,
22 mother's mother, siblings who share a mother, and so on. Additionally, sometimes unrelated people
23 have identical mitochondrial DNA.

1 A mitochondrial DNA sequencing analysis involves comparing the mitochondrial DNA of
2 two samples, and if the base sequence in the mitochondrial DNA samples match, searching a
3 mitochondrial DNA database to determine how common or uncommon that particular
4 mitochondrial DNA sequence is. The mitochondrial DNA comparison is comprised of four steps.
5 First, the analyst extracts the mitochondrial DNA from the cell. Second, the analyst amplifies a
6 portion of the mitochondrial DNA, meaning millions or billions of copies of that portion are made
7 so that there is a sample sufficient to analyze. Third, the analyst determines the order of the base
8 biological compounds, cytosine, guanine, adenine and thymine, in the sample. Finally, the analyst
9 compares the two samples, the sample from the known source and the sample from the unknown
10 source, to see whether they contain the same base sequence.

11 If the samples contain different base sequences, then the person who provided the known
12 sample can be excluded as the source of the unknown sample. When the samples are distinct, the
13 analysis ends at this point, as the ability to exclude the person who provided the known sample is
14 meaningful without statistical analysis.

15 However, if the samples contain the same sequence, then the base sequence found in the
16 samples is compared against a database of mitochondrial DNA to determine how rare or common
17 that particular sequence is. The frequency of the mitochondrial DNA sequence in the population
18 gives meaning to the conclusion that the known source cannot be excluded as the source of the
19 unknown sample. For example, if 8% of the population shares that sequence, the meaning of a
20 sequence match between the samples is far less probative than if only .02 % of the population
21 shares that sequence.

22 The FBI's mitochondrial DNA database, CODIS, is comprised of 4,000 mitochondrial DNA
23 samples from 4,000 individuals. The database does not include information about the name of the
24 donor or where the donor lives. The only information the database contains, in addition to the

1 mitochondrial DNA sequence of each sample, is the self-identified ethnicity of the person who
2 provided the sample. The FBI uses that information to categorize each mitochondrial DNA sample
3 into one of eleven different ethnic population group categories in the database. These population
4 groups are: African-American, Sierra Leone, Egyptian, Caucasian, Hispanic, Japanese, Korean,
5 Thai, China/Taiwan, Navajo, and Apache.

6 To give meaning to a “cannot exclude” conclusion, the FBI provides an upper bound
7 frequency estimate for each ethnic population group in the CODIS database. The upper bound
8 frequency estimate is the highest percentage of the population of a group that can be expected to
9 have that particular sequence of mitochondrial DNA. The confidence interval for the upper bound
10 frequency estimate is 95%. The FBI provides several upper bound frequency estimates rather than
11 just one for the entire database because studies have demonstrated differences between the groups,¹
12 and because donors to the database, or the source of the known sample, may not have accurately
13 reported their maternal ethnicity. The upper bound frequency estimate is calculated based on the
14 number of observations of the particular sequence of mitochondrial DNA in the database, and the
15 number of profiles in each ethnic population group category.

16 As an illustration of the meaning of the upper bound frequency estimate, consider the
17 following: If the upper bound frequency estimate is 2% for the Japanese population group, then, the
18 fact finder would know, with 95% certainty, that in a group of 1,000 Japanese individuals, at most
19 20 individuals could be expected to have the same sequence as the sample analyzed, and at least
20 980 individuals would not have the same mitochondrial DNA sequence.

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24 ¹ See, e.g., T. Melton et al., *Diversity and Heterogeneity in Mitochondrial DNA of North American Populations*, 46(1) J. FORENSIC. SCI. 46 (2001) (Commonwealth’s Ex. 7).

1 **B. Application of Rule 702**

2 **1. Legal Standard**

3 Rule 702 governs testimony by expert witnesses:

4 If scientific, technical, or other specialized knowledge will assist the trier of fact to
5 understand the evidence or to determine a fact in issue, a witness qualified as an
6 expert by knowledge, skill, experience, training, or education, may testify thereto in
7 the form of an opinion or otherwise if:

- 8 (1) the testimony is based upon sufficient facts or data,
9 (2) the testimony is the product of reliable principles and methods, and
10 (3) the witness has applied the principles and methods reliably to the facts of
11 the case.

12 NMI R. Evid. 702. The Court serves as the gatekeeper, ensuring that expert testimony is reliable
13 before it is presented to the jury. *See Commonwealth v. Crisostimo*, Crim. No. 12-0045 (NMI
14 Super. Ct. Feb. 7, 2013) (Order Granting *Daubert* Hearing at 2). Because the expert testimony must
15 be helpful to the trier of fact, it must be relevant. NMI R. Evid. 702; *see also Daubert v. Merrell*
16 *Dow Pharmaceuticals*, 509 U.S. 579, 589 (1993).² The Court’s role is to “screen the jury from
17 unreliable nonsense opinions, but not exclude opinions merely because they are impeachable. The
18 [Court] is not tasked with deciding whether the expert is right or wrong, just whether [her]
19 testimony has substance such that it would be helpful to a jury.” *Alaska Rent-A-Car, Inc. v. Avis*
20 *Budget Group, Inc.*, 738 F.3d 960, 969-70 (9th Cir. 2013).

21 To determine whether an expert’s testimony is admissible, the Court may consider the
22 following factors as applied to the expert’s reasoning, technique or methodology: (1) testability; (2)
23 peer review through publication; (3) known or potential error rate of a technique; and (4) general
24 acceptance in the relevant scientific or technical community. *See Daubert*, 509 U.S. at 593-94.

² Because Rule 702 is substantively identical to the Federal Rules of Evidence, this Court has previously applied the principles set forth in *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 597 (1993) to determine the admissibility of expert testimony. *See Commonwealth v. Lucas*, 2003 MP 9 ¶¶ 9-10 (looking to case law applying the Federal Rules of Evidence to interpret Commonwealth Rules of Evidence).

1 These factors “neither necessarily nor exclusively appl[y] to all experts or in every case,” but
2 instead are applied flexibly based on the circumstances of each particular case. *Kumho Tire Co. v.*
3 *Carmichael*, 526 U.S. 137, 141 (1999). “A trial court has broad latitude not only in determining
4 whether an expert’s testimony is reliable, but also in deciding how to determine the testimony’s
5 reliability.” *Crisostimo*, Crim. No. 12-0045 at 2 (quoting *Ellis v. Costco Wholesale Corp.*, 657 F.3d
6 970, 982 (9th Cir. 2011)).

7 **2. Relevance**

8 The results of the mitochondrial DNA analysis and Ms. Adams’ expert testimony
9 concerning those results have the potential to be relevant to the case. If found to be reliable,
10 mitochondrial DNA evidence that cannot exclude the alleged victim as the source of a hair found in
11 the car Defendant Crisostomo was allegedly driving on the night of her death is relevant to
12 determining whether the alleged victim and Defendant were together on the night she died.

13 **3. Expert Witness Qualifications**

14 Ms. Adams has sufficient qualifications, training, education and experience to be considered
15 an expert for the purposes of Rule 702. She has obtained advanced degrees in marine biology, and
16 has several years of experience performing mitochondrial DNA analysis procedures on whales and
17 other wildlife. These techniques are the same ones used in analyzing human mitochondrial DNA,
18 which she has done as a Forensic Examiner at the FBI since 2010. She has published two papers
19 concerning mitochondrial DNA. While working for the FBI, she has undergone extensive training
20 in mitochondrial DNA analysis procedures. This experience, education and training allow Ms.
21 Adams to provide helpful information.

22 **4. Comparison of Mitochondrial DNA**

23 The process of comparing the two mitochondrial DNA samples is reliable for the purposes
24 of Rule 702. This process, comprised of the four steps of extraction, amplification, sequencing and

1 sequence comparison, has been tested, peer reviewed, and has been generally accepted within the
2 scientific community for many years. *See, e.g.,* M.M. Holland & T.J. Parsons, *Mitochondrial DNA*
3 *Sequence Analysis—Validation and Use for Forensic Casework*, 11 FORENSIC SCI. REV. 21 (1999)
4 (Commonwealth’s Ex. 2); A. Carracedo et al., *Reproducibility of mtDNA analysis between*
5 *laboratories: a report of the European DNA profiling group (EDNAP)*, 97 FORENSIC SCI. INT’L 165
6 (1998) (Commonwealth’s Ex. 3); M.R. Wilson et al., *Extraction, PCR Amplification and*
7 *Sequencing of Mitochondrial DNA from Human Hair Shafts*, 18(4) BIOTECHNIQUES 662 (1995)
8 (Commonwealth’s Ex. 4); and Mark R. Wilson et al., *Validation of mitochondrial DNA sequencing*
9 *for forensic casework analysis*, 108 INT’L J. LEGAL MED. 68 (1995) (Commonwealth’s Ex. 5).

10 There is no indication that Ms. Adams or the FBI did not properly apply these procedures
11 and methods in this case. Ms. Adams concluded that the sample from Defendant did not match the
12 unknown sample, so Defendant could be excluded as the source of the unknown sample obtained
13 from the car. Ms. Adams also concluded that the sample from the alleged victim matched the
14 unknown sample, so the alleged victim cannot be excluded as the source of the hair obtained from
15 the car.

16 If two mitochondrial DNA samples do not have matching base sequences, then the analysis
17 ends upon making the comparison because the known sample source can be excluded as the source
18 of the unknown sample. Thus, the Court finds that Ms. Adams is qualified, under Rule 702, to
19 testify about her conclusion that Defendant Crisostomo can be excluded as the source of the hair
20 found in the rental car.

21 However, because the sample from the alleged victim and the sample from the car do have
22 matching base sequences, a statistical analysis is required to give meaning to the “cannot exclude”
23 conclusion of the comparison phase. Mitochondrial DNA is not a unique identifier, so without
24 information about the sequence’s frequency, the mere fact that the sequences match is not

1 meaningful to the finder of fact. Thus, the admissibility of testimony and test results concerning Ms.
2 Adams' conclusion that the alleged victim cannot be excluded as the source of the hair found in the
3 rental car depends on whether the statistical analysis is reliable under Rule 702.

4 **5. Statistical Analysis**

5 It is this final stage of the mitochondrial DNA profiling process, the application of statistics
6 and population genetics to the mitochondrial DNA sequence comparison conclusion, that has
7 generated the most controversy. *See Gov't of the V.I. v. Byers*, 941 F. Supp. 513, 517 (D.V.I. 1996);
8 *see also* Walther Parson et al., *The EDNAP mitochondrial DNA population database (EMPOP)*
9 *collaborative exercises: organization, results and perspectives*, 139 *Forensic Sci. Int'l* 215, 225
10 (2004) ("It is very likely that [mitochondrial DNA] population database compilations have not
11 undergone the same procedure of validation and confirmation by direct comparison as casework
12 profiles. It is evident that [mitochondrial DNA] databases require additional control mechanisms.").

13 In this case, Defendant Crisostomo argues that the upper bound frequency estimates
14 included in the FBI report are not reliable or helpful because the mitochondrial DNA sequence,
15 shared between the alleged victim and the unknown sample recovered from the rental car, were
16 compared against the FBI's CODIS database. Defendant Crisostomo argues that because the
17 CODIS database does not include samples representative of the population of the Northern Mariana
18 Islands, the upper bound frequency estimates provided for the ethnic groups in the CODIS database
19 are not useful. Thus, all testimony and evidence concerning the "cannot exclude" conclusion is
20 inadmissible under Rule 702.

21 The Commonwealth argues that only the first stage of the mitochondrial DNA analysis
22 should be subject to Rule 702, and that evidence concerning the meaning of the "cannot exclude"
23 conclusion merely goes to the weight of the conclusion, not its admissibility. The Court disagrees. It
24 goes against the very purpose of Rule 702 to have the jury, rather than the Court, assess the

1 reliability of expert testimony about specialized statistical information. *Cf. People v. Venegas*, 18
2 Cal. 4th 47, 83 (1998) (“To . . . leave it to jurors to assess the current scientific debate on statistical
3 calculation as a matter of weight rather than admissibility would stand Kelly-Frye on its head.”).

4 Ms. Adams testified at length about the reliability of the statistical analysis and Defendant’s
5 concerns regarding the shortcomings of the CODIS database as applied to the population of the
6 Northern Mariana Islands. She explained that it would, of course, be better to compare a
7 mitochondrial DNA sample sequence against a database representative of the actual population, but
8 that it is not feasible to include every person’s mitochondrial DNA in the database, or to create
9 specialized databases for each case. Ms. Adams explained that the use of a general database results
10 in a sampling bias but that a statistical analysis is applied to correct the sampling bias by increasing
11 the upper bound frequency estimate. As a result, there is 95% confidence in the upper bound
12 frequency estimate reported for each population group in the FBI report.

13 Ms. Adams testified that in the vast majority of cases, the CODIS database is sufficient.
14 However, she stated that this particular case has been the source of much discussion at the FBI and
15 is likely to prompt a change in standard operating protocol. Several ethnic groups present in the
16 Northern Mariana Islands, and therefore relevant in understanding the frequency of a mitochondrial
17 DNA sequence found in the Northern Mariana Islands, are not included in the CODIS database.
18 CODIS includes samples from individuals who identify as Chinese, Korean, Japanese and
19 Caucasian, so the FBI report includes upper bound frequency estimates for those groups. However,
20 CODIS does not contain profiles from individuals from the Philippines, of Chamorro or Carolinian
21 descent, or any other Micronesian population groups. Thus, the FBI report provides no information
22 about the frequency of the mitochondrial DNA sequence among these groups.

1 Based on a review of the filings, the testimony and exhibits presented during the *Daubert*
2 hearing, and the applicable law, the Court finds that the statistical analysis provided in this case is
3 not reliable, thus does not meet the standards of Rule 702.

4 First, the Court is seriously concerned about the reliability, and thus, usefulness of the
5 statistical method used to calculate the upper bound frequency estimates in the FBI report. The
6 CODIS database is comprised of 4,000 mitochondrial DNA sequences. The upper bound frequency
7 estimate is reported, not as a whole, but for each of the different ethnic population groups. The
8 more samples in a population group, the more accurate the upper bound frequency estimate is. Of
9 the ethnic groups represented in the CODIS database, the group with the most samples is the
10 Caucasian group, which accounts for 1,742 of the 4,000 samples. Because the mitochondrial DNA
11 sequence present in this case has never been observed in the CODIS database, the only variable
12 factor in calculating these upper bound frequency estimates is the number of samples in each
13 population group within the CODIS database. The upper bound frequency estimates in this case
14 range from .17% (Caucasian—most samples) to 2.71% (Sierra Leone—least samples). The Court
15 finds that these estimates are practically meaningless. They do not reflect anything about the
16 particular sequence in this case, but instead vary depending on the number of profiles of each ethnic
17 population category in the CODIS database. *See also* M.M. Holland & T.J. Parsons, *Mitochondrial*
18 *DNA Sequence Analysis—Validation and Use for Forensic Casework*, 11 FORENSIC SCI. REV. 21,
19 32 (1999) (Commonwealth’s Ex. 2) (“For rarer [mitochondrial DNA] types, including new
20 sequences that have not been observed in the database, we have no good estimate of the true
21 frequency in population.”).

22 Ms. Adams emphasized several times that it is never appropriate to report just one upper
23 bound frequency estimate, but instead the results must be separated out by population group. *See*
24 *also* T. Melton et al., *Diversity and Heterogeneity in Mitochondrial DNA of North American*

1 *Populations*, 46(1) J. FORENSIC. SCI. 46 (2001) (Commonwealth’s Ex. 7). The risk of reporting only
2 one upper bound frequency estimate is that frequencies of particular sequences vary between ethnic
3 population groups, meaning, for example, that a sequence could be very common among
4 Caucasians but rare among Chinese. Lumping together the profiles from these two groups to
5 calculate the upper bound frequency estimate would result in a lower percentage estimate, which
6 makes the sequence appear rarer in general than it is among Caucasians. Such a result would be
7 unfair to a defendant in a case where a “cannot exclude” finding implicates the defendant in some
8 way; because the rarer the sequence appears, the higher the percentage of the population that can be
9 excluded as the source of that sequence. Similarly, it is not appropriate to provide a single upper
10 bound frequency estimate based on the reported ethnicity of the person providing the known sample
11 because such a reported ethnicity may not accurately reflect the person’s maternal lineage and thus
12 could result in an inaccurate upper bound frequency estimate.

13 This brings the Court to the second area of concern: The CODIS database does not include
14 several of the major ethnic groups of the Northern Mariana Islands, such as Filipinos, Chamorros,
15 Carolinians, or any other Micronesian population group. Ms. Adams’ explanation of the problems
16 with providing upper bound frequency estimates based on only one ethnic population group, or the
17 combination of multiple population groups, indicates that the lack of a representative database
18 results in the absence of useful information for the jury. The jury simply will not know how
19 common or rare the mitochondrial DNA sequence at issue in this case is among relevant NMI
20 population groups, such as Filipinos, Chamorros, Carolinians and other Micronesians. The jury
21 could guess, based on the upper bound frequency estimates provided in the FBI report. But as
22 described above, those estimates vary solely depending on the number of profiles in the CODIS, not

1 on how common or rare this sequence actually is, because it has never been observed in CODIS.³

2 Ms. Adams testified that the most common mitochondrial DNA sequence known within the
3 Caucasian population is present in about 8% of Caucasians. However, the jury will have no
4 information about whether there are any mitochondrial DNA sequences that are particularly
5 common in ethnic groups represented in the Northern Mariana Islands.

6 Ms. Adams reported that there is another database available (“EMPOP”) that includes
7 mitochondrial DNA sequence samples from individuals from the Philippines, and that she could file
8 a supplemental report that includes the upper bound frequency estimate of the sequence found in
9 this case to the sequences found in the Filipino population. However, at this time, such a report is
10 not before the Court. Furthermore, no evidence was presented that indicated EMPOP contains
11 Micronesian population groups.

12 Finally, the Court notes that this jurisdiction is geographically remote, and has a history of
13 relatively isolated migration waves. No evidence was presented to indicate that the genetics of such
14 a small and isolated island population could be expected to reflect those of continental and less-
15 isolated populations. *Cf. United States v. Chischilly*, 30 F.3d 1144, 1157-58 (9th Cir. 1993)
16 (acknowledging that, in the case of nuclear DNA profiling, geographic factors could increase
17 possible prejudice in the FBI database because certain alleles occur more frequently in Navajos and
18 many Navajos reside on the Navajo Nation).

19 It is true that the Commonwealth of the Northern Mariana Islands is part of the United
20 States’ political family, but the population here may not reflect similar maternal lineage. It is simply
21 not known whether there are mitochondrial DNA sequences that are very common in the Northern
22

23 ³ The upper bound frequency estimates found in the FBI report is a percentage roughly equal to 3 divided by the
24 number of profiles in a particular population group. *See* Scientific Working Group on DNA Analysis Methods,
Interpretation Guidelines for Mitochondrial DNA Analysis by Forensic DNA Testing Laboratories (2013),
http://swgdam.org/SWGDAM%20mtDNA_Interpretation_Guidelines_APPROVED_073013.pdf.

1 Mariana Islands. Nor is it known whether the mitochondrial DNA sequence at issue in this case
2 might be such a sequence. Ms. Adams, in her testimony on February 18, 2014, noted that “without
3 further studies, it would be difficult for me to determine whether there are issues at play in the
4 Northern Mariana Islands that might make them different from ethnic categories that reside [in the
5 mainland United States].” Even for the population groups that are reflected in the FBI report, such
6 as Caucasian and Japanese, the jury would be forced to guess whether the upper bound frequency
7 estimate for ethnic groups present in the Northern Mariana Islands would be similar to those ethnic
8 groups found in very different circumstances as to geographic isolation and relative population size.

9 In sum, the Court finds that the data underlying the statistical analysis is not sufficient to
10 provide reliable information to the jury. *See* NMI R. Evid. 702(1). The upper bound frequency
11 estimates that are provided in the FBI report give more information about the number of profiles in
12 CODIS than they do about the actual frequency of the sequence found in this case; CODIS does not
13 include several of the relevant population groups of the Northern Mariana Islands; and without
14 further studies, there is no information available about whether the population groups of the
15 Northern Mariana Islands differ from similar population groups in other locations due to the
16 geographic location and genetic history of the Northern Mariana Islands.

17 **IV. CONCLUSION**

18 Accordingly,

19 1. As to the conclusion that Defendant Crisostomo can be excluded as the source of the
20 unknown mitochondrial DNA sample, Defendant Crisostomo’s motion to exclude the
21 mitochondrial DNA test results and expert testimony concerning those results is

22 **DENIED;**

23 2. As to the conclusion that the alleged victim cannot be excluded as the source of the
24 unknown mitochondrial DNA sample, Defendant Crisostomo’s motion to exclude the

1 mitochondrial DNA test results and expert testimony concerning those results is

2 **GRANTED;**

- 3 3. As to the conclusion that Defendant Crisostomo can be excluded as the source of the
4 unknown mitochondrial DNA sample, the Commonwealth's motion to certify Ms.
5 Adams as an expert qualified to testify about the mitochondrial DNA test results is

6 **GRANTED;** and

- 7 4. As to the conclusion that the alleged victim cannot be excluded as the source of the
8 unknown mitochondrial DNA sample, the Commonwealth's motion to certify Ms.
9 Adams as an expert qualified to testify about the mitochondrial DNA test results is

10 **DENIED.**

11
12 **IT IS SO ORDERED** this 14th day of March, 2014.



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15 **JOSEPH N. CAMACHO**
Associate Judge

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