10.1 PURPOSE:

10.1.1 To provide a general guideline for the preparation of mtDNA reports. However, it is not an exhaustive list of all possible casework scenarios. Other reporting strategies may be used with approval of the TL.

Note: Mitochondrial DNA Reports are located in the controlled DNA Report Template on the ~~U and S drives.~~ S drive. Finalized Mitochondrial DNA Reports are located on the U drive.

10.2 RESPONSIBILITY:

10.2.1 Forensic Science Examiners from the CT DESPP Division of Scientific Services who have been trained in the discipline of Mitochondrial DNA Analysis according to the Mitochondrial DNA Section Training Manual.

10.3 Writing Reports:

10.3.1 When a CODIS 7.0 (SP3) database search (containing 10,629 individuals) is conducted, the report will include a database table containing the search results of the three major population groups of the United States: African-American, Caucasian, and Hispanic. The table may also contain other applicable populations where appropriate. In addition, the report will contain the search results of any other population where a matching type is found.

10.3.2 Cases in which the DNA sequences are concordant:

10.3.2.1 Example 1:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

Item	**#1**	**#2**	**#3**
Range (bp)	15998-16389	15998-16389	15998-16388
	16124 C	16124 C	16114 A
	16223 T	16223 T	16129 A
HV1	16319 A	16319 A	16213 A
			16223 T
			16278 T
			16355 T
			16362 C
Range (bp)	49-380	49-407	49-407
	73 G	73 G	73 G
	150 T	150 T	150 T
	152 C	152 C	152 C
HV2	263 G	263 G	182 T
	315.1 C	315.1 C	195 C
			198 T
			204 C
			263 G
			315.1 C

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 and #2. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, J. DOE (or another member of the same maternal lineage) cannot be excluded as the source of item #1.

Searching the mtDNA population database (CODIS7.0, containing 10,629 individuals, at positions 16024 – 16365 and 73 – 340) the mtDNA sequence obtained from items #1 and #2 has been observed in African American, Caucasian, and Hispanic populations as follows:

Group	Number of Observations	Individuals in Group	Upper Bound Frequency Estimate
African-American	0	2449	0.12% or 1 in 833
Caucasian	0	2609	0.11% or 1 in 909
Hispanic	0	2576	0.12% or 1 in 833

10.3.2.2 Example 2:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here]

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 and #2. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, J. DOE (or another member of the same maternal lineage) cannot be excluded as the source of item #1.

Searching the mtDNA population database (CODIS7.0, containing 10,629 individuals, at positions 16024 – 16365 and 73 – 340), the mtDNA sequence obtained from items #1 and #2 has been observed in African American, Caucasian, Hispanic, and Native American populations as follows:

Database	Number of Observations	Individuals in Database	Upper Bound Frequency Estimate
African-American	0	2449	0.12% or 1 in 833
Caucasian	0	2609	0.11% or 1 in 909
Hispanic	0	2576	0.12% or 1 in 833
Native American	2	1036	0.46% or 1 in 217

10.3.3 Cases in which the DNA sequences are concordant, but a complete sequence was not obtained from all regions:

10.3.3.1 Example:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here]

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 (nucleotide positions 16005-16236 and 49-407 only) and #2. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, J. DOE (or another member of the same maternal lineage) cannot be excluded as the source of item #1.

Searching the mtDNA population database (CODIS7.0, containing 10,629 individuals, at positions 16024 – 16236 and 73 – 340), the mtDNA sequence obtained from items #1 and #2 has been observed in African American, Caucasian, and Hispanic populations as follows:

[Insert database search results table here]

10.3.4 Cases in which the DNA sequences are not concordant:

10.3.4.1 Example:

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 and #2. The mtDNA sequences obtained from items #1 and #2 are different. Therefore, J. DOE is excluded as the source of item #1.

10.3.5 Cases in which the DNA sequences of the evidentiary sample and one known sample are concordant and the DNA sequences of the evidentiary sample and a different known sample are not concordant:

10.3.5.1 Example:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here for the concordant samples]

Mitochondrial DNA (mtDNA) sequences were obtained from items #1, #2, and #3. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, J. DOE (or another member of the same maternal lineage) cannot be excluded as the source of item #1.

Searching the mtDNA population database (CODIS 7.0, containing 10,629 individuals, at positions 16024 – 16365 and 73 – 340), the mtDNA sequence obtained from items #1 and #2 has been observed in African American, Caucasian, and Hispanic populations as follows:

[Insert database search results table here]

The mtDNA sequence obtained from item #3 is different from the sequence obtained from item #1. Therefore, J. SMITH is excluded as the source of item #1.

10.3.6 Cases in which the DNA sequences in the evidentiary and known samples are concordant and sequence heteroplasmy is present:

10.3.6.1 Example:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here]

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 and #2. The mtDNA sequence obtained from item #1 is concordant with the mtDNA sequence obtained from item #2. Therefore, J. DOE (or another member of the same maternal lineage) cannot be excluded as the source of item #1.

Searching the mtDNA population database (CODIS 7.0, containing 10,629 individuals, at positions 16024 – 16365 and 73 – 340), the mtDNA sequence obtained from items #1 and #2, including all four nucleotides, A, C, G, and T, at position 16069, has been observed in African American, Caucasian, and Hispanic populations as follows:

[Insert database search results table here]

10.3.7 Cases in which the DNA sequences from the evidentiary and known samples differ by a single nucleotide, and no evidence of a common nucleotide is present in the questioned and/or known sample at the position of difference:

10.3.7.1 Example:

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here]

Mitochondrial DNA (mtDNA) sequences were obtained from items #1, #2 , #3, and #4. The mtDNA sequence obtained from item #1 is the same as those obtained from items #2, #3, and #4, with the exception of position 16069. At this position, the presence of a thymine (T) was observed in item #1. In items #2, #3, and #4, a cytosine (C) was observed at position 16069. Due to the one base pair difference observed between item #1 and items #2, #3, and #4, the results are inconclusive as to whether J. DOE is excluded as the source of items #2, #3, and #4.

10.3.8 Cases in which there is a sample with an apparent mixture of more than one DNA sequence:

10.3.8.1 Example:

A mitochondrial DNA (mtDNA) sequence was obtained from item #1. The mitochondrial DNA (mtDNA) sequence obtained from item #1 indicates the presence of a mixture of mtDNA from more than one individual. Therefore, no conclusions can be made for this item. No other mtDNA examinations were conducted for this item.

10.3.9 Cases in which there is a sample with an apparent mixture, but a complete sequence was not obtained from all regions:

10.3.9.1 Example:

A mitochondrial DNA (mtDNA) sequence was obtained from item #1 (nucleotide positions 16005-16236 and 49-407 only). The mtDNA sequence obtained from item #1 indicates the presence of a mixture of mtDNA from more than one individual. Therefore, no conclusions can be made for this item. No other mtDNA examinations were conducted for this item.

10.3.10 Cases in which two evidentiary samples are concordant but (1) no known samples are available for comparison or (2) they do not match the known samples tested:

10.3.10.1 Example:

Mitochondrial DNA (mtDNA) sequences were obtained from items #1 and #2. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, items #1 and #2 cannot be excluded as coming from a common source. Since no known samples were submitted, no further comparisons can be made at this time.

Mitochondrial DNA (mtDNA) sequences were obtained from items #1, #2, and #3. The mtDNA sequences obtained from items #1 and #2 are the same. Therefore, items #1 and #2 cannot be excluded as coming from a common source. The mtDNA sequences obtained from items #1 and #2 are different from item #3. Therefore, J. DOE is excluded as the source of items #1 and #2.

Optional: At the analyst's discretion, a mtDNA sequencing results table and database search results table can be inserted into the report for those samples that cannot be excluded as coming from a common source.

The mtDNA sequencing results are detailed below. Results are listed as differences from the published revised Cambridge Reference Sequence (rCRS).

[Insert mtDNA sequencing results table here]

Searching the mtDNA population database (CODIS 7.0, containing 10,629 individuals, at positions 16024 – 16365 and 73 – 340), the mtDNA sequence obtained from items #1 and #2 has been observed in African American, Caucasian, and Hispanic populations as follows:

[Insert database search results table here]

10.3.11 Cases in which no sequence was obtained for a sample:

10.3.11.1 Example:

Insufficient amplification products were detected for item # to generate a mtDNA sequence, therefore no comparisons could be made for this item.

10.3.12 Cases in which no mtDNA examination was conducted because no microscopic comparisons were made:

10.3.12.1 Example:

Because no microscopic associations between the questioned hairs and the known hair standards were made in this case, no mitochondrial DNA examinations were conducted.

10.3.13 Cases in which no mtDNA examination was conducted because the remains were determined to be of non-human origin:

10.3.13.1 Example:

Dr. J. Smith examined item #1 ~~(bone)~~. ~~The bone~~ Item #1 is not of human origin; therefore, no mitochondrial DNA examinations were conducted.

10.3.14 Cases in which the mtDNA sequence is not of the requisite quality:

10.3.14.1 Example:

The mitochondrial DNA (mtDNA) sequence obtained from item #1 was not of the requisite quality, therefore no comparisons could be made for this item.

10.3.15 Missing Persons cases:

10.3.15.1 Example:

A mitochondrial DNA (mtDNA) sequence was obtained from item #1. The mtDNA sequence from item #1 will be entered into the Connecticut and National DNA Databases. The submitting agency will be notified of any positive associations.