South Texas Regional Crime Laboratory 1 Austin Way Austin, TX 12345

Y-screening and DNA Analysis Report

Subsequent submission

Investigating Officer: Detective Jones **Report Date**: April 1, 2017

Persons of Interest:

Victim: Maria Murphy
Suspect: Sebastian Bruno

List of Evidence:

04: Sexual Assault Kit (Maria Murphy)
05: Blood card from Maria Murphy
06: Buccal swab standard, Sebastian Bruno

Requested Analysis: Perform forensic DNA analysis including screening for the presence of biological evidence and male DNA

Evidence Description, Results of Analysis and Interpretation:

Portions of the items were extracted by a method which yields DNA.

When necessary, the items were extracted by a two-step method which first recovers DNA from non-sperm cells (epithelial cell fraction) and then recovers DNA from sperm cells (sperm cell fraction).

The DNA isolated was analyzed using STR (Short Tandem Repeat) PCR (Polymerase Chain Reaction) analysis. The following loci were examined: D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, Amelogenin, D5S818, and FGA.

04: Sexual Assault Kit (Maria Murphy)

04-02: rectal swabs

No male DNA was detected on this item utilizing Quantifiler Trio.

04-03: oral swabs

No male DNA was detected utilizing Quantifiler Trio.

04-04: breast swabs

The DNA profile from the epithelial cell fraction is interpreted as originating from a single individual. Maria Murphy is an assumed contributor to this profile. Sebastian Bruno is excluded as possible contributor of the profile.

The DNA profile from the sperm cell fraction of this item is interpreted as a mixture of two individuals with Maria Murphy as an assumed contributor. Based on the likelihood ratio result, Sebastian Bruno is excluded as a contributor to this profile (refer to Appendix).

04-05-AB: left hand fingernail swabs

No male DNA was detected on this item utilizing Quantifiler Trio.

05: Blood card from Maria Murphy

The DNA profile from this item was used as a reference.

06: Buccal swab standard, Sebastian Bruno

The DNA profile from this item was used as a reference.

Investigative Leads and Requirements for Further Analysis:

The DNA profile obtained from the sperm cell fraction of the breast swabs foreign to Maria Murphy will be entered into the Combined DNA Index System (CODIS) and will be searched against the local, state, and/or national databases.

Disposition:

The DNA extracts will be retained by our Laboratory.

DNA Report Appendix

Likelihood Ratios:

If the report contains likelihood ratios, they are calculated based on allele frequency data from the U.S. Caucasian, African American, Asian (Investigator 24plex kit only) and Hispanic population groups. Any likelihood ratio information in the report represents the lowest likelihood ratio calculated from these groups, and other likelihood ratios are present in the case record which may be discoverable under Article 39.14 of the Texas Code of Criminal Procedure.

Likelihood ratios occur on a continuum from zero to infinity and are calculated by dividing the probability of the evidence given proposition 1 by the probability of the evidence given proposition 2. Typically, proposition 1 is an explanation of the DNA profile if it originated from a person of interest while proposition 2 is an explanation of the DNA profile if it originated from an unknown, unrelated individual.

A likelihood ratio of greater than 0.5 but less than 2 is termed uninformative and indicates both propositions are nearly equally supported.

A likelihood ratio of below 0.01 indicates an exclusion.

Likelihood ratios of greater than or equal to 0.01 and less than or equal to 0.5 are converted prior to reporting by using the formula Z = 1/likelihood ratio. For example, if a likelihood ratio of 0.2 was obtained, this number would be converted by dividing 1 by 0.2 to get a reported likelihood ratio of 5. As the reported likelihood ratio (Z) increases in value from 2, it indicates a stronger degree of support for the second proposition that the DNA profile is explained if it originated from an unknown, unrelated individual.

Likelihood ratios of 2 or greater are not converted prior to reporting. As these likelihood ratios increase in value from 2, they indicate a stronger degree of support for the first proposition that the DNA profile is explained if it originated from the person of interest.

DPS validations have shown that, when using the Identifiler Plus or Investigator 24plex amplification kits, a likelihood ratio between 0.01 and 1000 may indicate adventitious support for an incorrect proposition. For the Minifiler amplification kit, a likelihood ratio between 0.01 and 10,000 may indicate adventitious support for an incorrect proposition.

PCR Amplification Kits:

The Texas Department of Public Safety reports information from several PCR (polymerase chain reaction) amplification kits. These kits use PCR to amplify STR (short tandem repeat) loci. The Profiler Plus kit amplifies the following loci: D3S1358, vWA, FGA, Amelogenin, D8S1179, D21S11, D18S51, D5S818, D13S317, and D7S820. The Cofiler kit amplifies

the following loci: D3S1358, D16S539, Amelogenin, TH01, TPOX, CSF1PO, and D7S820. The Minifiler kit amplifies the following loci: D13S317, D7S820, Amelogenin, D2S1338, D21S 11, D16S539, D18S51, CSF1PO, and FGA. The Identifiler and Identifiler Plus kits amplify the following loci: D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, Amelogenin, D5S818, and FGA. The Investigator 24plex kit amplifies the following loci: Amelogenin, TH01, D3S1358, vWA, D21S11, TPOX, DYS391, D1S1656, D12S391, SE33, D10S1248, D22S1045, D19S433, D8S1179, D2S1338, D2S441, D18S51, FGA, D16S539, CSF1PO, D13S317, D5S818, and D7S820.

DNA profiles from evidentiary items were evaluated prior to any comparisons to reference samples.