



SEROLOGICAL RESEARCH INSTITUTE

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May 11, 2007

SERI Case No. M688206  
Agency Case No. 1993-WVS-Q5716  
93-05-0666

Suspects: Damien Echols  
Jason Baldwin  
Jessc Misskelley

THIRD ANALYTICAL REPORT

On February 22<sup>nd</sup> 2006, three items were received at the Serological Research Institute (SERI) by hand from Nancy Pemberton, Law Office of Michael Burt. An Analytical Report in respect of these items was prepared on May 22<sup>nd</sup> 2006. On November 22<sup>nd</sup> 2006, four additional items were received at SERI from Riordan and Horgan, Attorneys at Law, via Federal Express (791173238251 and 792887855539). A Second Analytical Report in respect of these items was prepared on February 27<sup>th</sup> 2007. On February 16<sup>th</sup> 2007, two additional items were received at SERI from Riordan and Horgan, Attorneys at Law, via Federal Express (791233220112), and on March 8<sup>th</sup> 2007, one additional item was received at SERI from Riordan and Horgan, Attorneys at Law, via Federal Express (792946172064). Mitochondrial DNA testing was requested and is reported herein.

ITEM 8 CIGARETTE BUTTS FROM FRONT YARD

This item consists of two filtered cigarette butts. A portion of the unburned end was excised from one of them and extracted for DNA content. The recovered DNA was quantified and sequenced by PCR using mitochondrial DNA primers. The results are tabulated below.

ITEM 9 CIGARETTE BUTTS FROM DRIVEWAY

This item consists of two filtered cigarette butts. A portion of the unburned end was excised from one of them and extracted for DNA content. The recovered DNA was quantified and sequenced by PCR using mitochondrial DNA primers. The results are tabulated below.

ITEM 10 CIGARETTE BUTTS FROM ASHTRAY

This item consists of two filtered cigarette butts. A portion of the unburned end was excised from one of them and extracted for DNA content. The recovered DNA was quantified and sequenced by PCR using mitochondrial DNA primers. The results are tabulated below.

**MITOCHONDRIAL RESULTS (HV1)**

| Item # | Description    | HVI | 16093 | 16129 | 16221 | 16223 | 16278 | 16316 |
|--------|----------------|-----|-------|-------|-------|-------|-------|-------|
|        |                | CRS | T     | G     | C     | C     | C     | A     |
| 8      | Cigarette Butt |     | C     |       | T     |       |       |       |
| 9      | Cigarette Butt |     |       | R     |       | Y     | Y     | R     |
| 10     | Cigarette Butt |     | C     |       | T     |       |       |       |

\* Hypervariable Region 1 (HV1) for these samples includes base positions 16018-16374.

**Legend**  
 CRS-CAMBRIDGE REFERENCE SEQUENCE PUBLISHED BY ANDERSON ET AL.  
 R-BOTH A "G" PEAK AND "A" PEAK ARE PRESENT  
 BLANK-NUCLEOTIDE IS THE SAME AS CRS AT THIS POSITION

**MITOCHONDRIAL RESULTS (HV2)**

| Item # | Description      | HVI | 73 | 153 | 195 | 226 | 263 | 309.1 | 315.1 |
|--------|------------------|-----|----|-----|-----|-----|-----|-------|-------|
|        |                  | CRS | A  | A   | T   | T   | A   | :     | :     |
| 8      | Cigarette Butt   | *   |    |     |     |     | G   | C     | C     |
| 9      | Cigarette Butt   |     | R  | R   | Y   | Y   | G   | C     | C     |
| 10     | Cigarette Butt   | *   |    |     |     |     | G   | C     | C     |
|        | Extraction Blank |     |    |     |     |     | G   | C     | C     |

\* Hypervariable Region 2 (HV2) for these samples includes base positions 72-383  
 \* Length heteroplasmy at 309.2

**Legend**  
 CRS-CAMBRIDGE REFERENCE SEQUENCE PUBLISHED BY ANDERSON ET AL.  
 Y-BOTH A "C" PEAK AND "T" PEAK ARE PRESENT  
 :-INSERTION (NO NUCLEOTIDE PRESENT IN THIS POSITION IN THE CRS)  
 R-BOTH A "G" PEAK AND "A" PEAK ARE PRESENT  
 N-NUCLEOTIDE COULD NOT BE CONFIRMED AT THIS POSITION  
 BLANK-NUCLEOTIDE IS THE SAME AS CRS AT THIS POSITION

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### EXPLANATION

See Analytical Reports dated May 22<sup>nd</sup> 2006, and February 27<sup>th</sup> 2007.

### CONCLUSIONS

The mitochondrial DNA profiles obtained from items 8, 9 and 10 are tabulated above. Items 8 and 10 possess the same mitochondrial sequence and, therefore, the DNA recovered from them may have originated from the same person or maternal line. DNA recovered from item 9 is a mixture from more than one person, neither/none of whom belong(s) to the same maternal line as the person(s) represented by items 8 and 10.

I have reviewed a Mitochondrial Forensic DNA Case Report from The Bode Technology Group, Inc., dated December 30, 2005, and compared the results therein to the mitochondrial DNA sequences tabulated above. In my view, however, the DNA mixture recovered from cigarette butt item 9 is unsuitable for comparison to the hairs analyzed at Bode, because the mitochondrial sequence of any one individual in the mixture is uncertain.

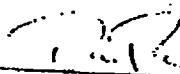
The mitochondrial sequence recovered from cigarette butt items 8 and 10 differs at one nucleotide position from the sequence Bode obtained from hair 2S04-114-03Aa, described as 'hair from ligature (Moore)'. The sequence obtained from the cigarette butts shows an additional polymorphism (16093C) that the ligature hair does not possess. As this difference may be due to heteroplasmy, the person(s) who left DNA on the cigarette butts 8 and 10 (and anyone in his/their maternal lineage) are not excluded as the source of the ligature hair 2S04-114-03Aa. A search of the FBI's Forensic Mitochondrial DNA Database of 4839 samples (consisting of 1674 Caucasians, 686 Hispanics, 848 Asians, 326 Native Americans and 1305 Africans and African Americans) showed three (0.06%) to have the same mitochondrial sequence as the cigarette butts 8 and 10 and three (0.06%) database samples to have a sequence differing at only one nucleotide position.

The person(s) who left DNA on the cigarette butts 8 and 10 (and anyone in his/their maternal lineage) is/are excluded as the source of all the hairs analyzed at Bode that are not specifically discussed above.

### EVIDENCE DISPOSITION

Please advise.

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Thomas Fedor  
Forensic Serologist

SERI/CaseFiles/M'6882'06/Rpt.3

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