

**AFFIDAVIT OF DAN E. KRANE**

State of \_\_\_\_\_ )  
  ) ss.  
County of \_\_\_\_\_ )

Before the undersigned Notary Public, duly qualified and acting in and for said county and state, appeared Dan E. Krane, to me well known to be the affiant herein, who stated the following under oath:

“1. I, Dan E. Krane, I am a Full Professor in the Department of Biological Sciences at Wright State University in Dayton, Ohio. I have a B.S. degree with a double major in Biology and Chemistry from John Carroll University (Cleveland, Ohio), and a Ph.D. from the Biochemistry program of the Cell and Molecular Biology Department of the Pennsylvania State University (State College, Pennsylvania). I have also done postdoctoral research using the tools of molecular biology to answer questions in the fields of population genetics and molecular evolution in the Genetics Department of the Washington University Medical School (St. Louis, Missouri) and in the Department of Organismic and Evolutionary Biology of Harvard University (Cambridge, Massachusetts). I have published more than 30 scholarly papers in a variety of topics including population genetic

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studies of the genetic diversity of human populations at DNA typing loci, of organisms exposed to environmental stressors, and the use of DNA typing in forensic science. I am also the lead author of a widely-used undergraduate textbook, *Fundamental Concepts of Bioinformatics*. I am a member of the Commonwealth of Virginia's Scientific Advisory Committee, a 12-member panel established by statute to provide oversight and guidance to the Virginia Department of Forensic Science (the crime laboratory for the Commonwealth of Virginia). I have testified in over 60 criminal proceedings that have involved forensic DNA typing (in 22 different states and in three different Federal courts within the United States, a United States court martial, a Coronial Inquest in the State of Victoria in Australia, and in Belfast Crown Court in Northern Ireland).

2. I have been asked by Michael Burt, an attorney in the State of California, to provide this affidavit in connection with a case identified to me under the names *State of Arkansas v. Jessie Misskelley Jr.* and *State of Arkansas v. Damien Echols and Jason Baldwin*. My understanding is that this affidavit will be submitted to one or more courts by Mr. Burt on behalf of his client Jessie Misskelley, as well as on behalf of Damien Echols and Jason Baldwin.

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3. I have been provided a CD-Rom by Mr. Burt containing the electronic DNA data for certain evidence samples in this case which were subjected to STR DNA analysis by Bode Laboratory. I have also been provided with a report from Bode reporting the DNA profiles for the three defendants in the case (Misskelley, Echols, and Baldwin), and the three victims (Branch, Byers, and Moore). Using reliable and generally accepted computer analysis techniques I studied and analyzed the data using the same analysis software utilized by the testing laboratory (Applied Biosystems' GeneScan® and Genotyper®).
4. One of the tested samples is a reported sperm fraction of a penile swab from Mr. Branch labeled, "1\_062105-10-G1\_A05\_10E1SF(10).2\_01" and tested on June 21, 2005.
5. Bode laboratory utilized a 75 RFU minimum peak height threshold in their review of the sample.
6. A limit of detection (LOD) is a statistically-based minimum peak height threshold that determines the height at which signal can be distinguished from noise. A limit of quantitation (LOQ) is the height at which signal can be distinguished from noise and the amount of signal can be reliably measured. The methodology for employing an

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LOD or LOQ has been in use in analytical chemistry for several decades. The methodology for STR DNA testing results has been published (J. Gilder, T. Doom, K. Inman, and D. Krane. "Run-specific limits of detection and quantitation for STR-based DNA testing." Journal of Forensic Sciences. 2007;52(1):97-101).

7. The limit of detection (LOD) for the analysis run performed on June 21, 2005 is approximately 16 RFUs and the limit of quantitation (LOQ) is approximately 39 RFUs based on the reagent blank sample "1\_062105-10-SG1\_A01\_RB1.2\_01."
8. Sample 10E1SF contains additional peaks below the Bode threshold of 75 RFUs and above the limit of detection (LOD) and limit of quantitation (LOQ). For example, the D21S11 locus exhibits a 32.2 allele at 64 RFUs. None of the defendants nor Branch have a 32.2 at D21S11. All defendants and Branch are excluded from contributing the DNA profile observed at D21S11.
9. In addition, the FGA locus exhibits a 19 allele at 33 RFUs, which exceeds the limit of detection (LOD). None of the defendants nor Branch have a 19 at FGA. All defendants and Branch are excluded from contributing the DNA profile observed at FGA.
10. The D16S539 results contain an 8 and 11 peaks of approximate equal

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height (102 and 97 RFUs, respectively). Since these peaks are above the limit of detection (LOD), they are statistically likely to be associated with true signal and not noise. I have looked carefully at those signals to see if they can be explained as technical artifacts such as 'pull-up,' 'spikes,' or 'stutter' and I have determined that they are most likely to be legitimate signal arising from DNA associated with the evidence sample. The simplest interpretation of these two peaks is that these are alleles that originated from a single individual.

11. None of the tested victims or defendants have an 8, 11 at the D16S539 locus. All victims and defendants are therefore excluded as the source of the penile swab sample.
12. If called to testify in court, I would provide truthful and accurate testimony about all the subjects that I have covered here."

Further the affiant sayeth naught.


IN WITNESS WHEREOF, I hereunto set my hand this 28<sup>th</sup> day of May, 2008.

  
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DAN E. KRANE

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Subscribed and sworn to before me this 28<sup>th</sup> day of May, 2008.

  
Notary Public

My commission expires:

**Carolyn Rowland**  
**Notary Public, State of Ohio**  
My Commission Expires March 9th, 2013

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