

AFFIDAVIT OF F. SAMUEL BAECHTEL
DNA ANALYSIS UNIT I
FEDERAL BUREAU OF INVESTIGATION LABORATORY

1. I am employed as a Forensic DNA Examiner in the Laboratory Division (DNA Analysis Unit I) of the Federal Bureau of Investigation. I hold a Ph.D. in Biochemistry from Virginia Polytechnic Institute and State University in Blacksburg, Virginia. I have 31 publications related to forensic biology, including 21 devoted to various aspects of DNA profiling.
2. I have been associated with forensic biology since 1982, when I joined the FBI Laboratory's Forensic Science Research and Training Unit. During the initial years of my FBI employment, I conducted developmental research studies on methods for the identification and individualization of semen stains. My experience with forensic DNA profiling began in 1987, when I was assigned to the research team that was charged with the development, adaptation, validation, and implementation of DNA profiling methods in our Laboratory.
3. The initial DNA profiling method which I assisted in bringing to fruition is called restriction fragment length polymorphism analysis (RFLP). This procedure was used in the FBI Laboratory from December 1988 until 1998.
4. I have been responsible for the planning, management, and much of the instruction in DNA profiling courses taught by the FBI Laboratory at our Academy in Quantico, Virginia. More than 700 persons from crime laboratories throughout the United States and many foreign countries have been participants in these courses.
5. I was a member of the group that conceived the basic structure for a computer-based program that would enable law enforcement agencies to interchange DNA profiles. This system, which now is in nationwide use, is called the Combined DNA Index System.
6. In 1991, I began research studies on a DNA profiling system that utilized the polymerase chain reaction (PCR). This research entailed the establishment of conditions for DNA amplification, electrophoretic separation, and identification of the amplified products at genetic locus D1S80. This profiling system was ultimately incorporated into the routine protocols of the DNA case-working unit of the Laboratory.
7. In 1995, I departed the Research and Training Unit and joined DNA Analysis Unit I (DNAI) of the FBI Laboratory as an Examiner. DNAI is the forensic case-working unit of the Laboratory with responsibility for the performance of serological and nuclear DNA profiling examinations on evidentiary materials submitted in criminal cases from law enforcement agencies throughout the

United States.

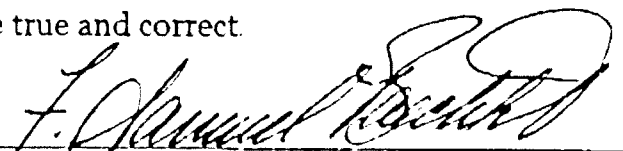
8. To be certified as an Examiner in DNAI, I had to successfully complete the Unit training program, which included case management policies, technical performance of all methods employed in the Unit, passage of oral board examinations and a series of moot court sessions. In addition, I have participated in courses in molecular biology, statistics as it applies to DNA profiling, short tandem repeat testing, and crime scene search techniques.
9. Since qualifying as an Examiner in DNAI, I have been responsible for the management and analyses of more than 800 criminal case submissions to the Laboratory. I have been accepted as an expert in serological and/or DNA analyses 70 times in state and federal courts in 23 states or territories, the District of Columbia and one foreign country. I have utilized and testified to all DNA profiling techniques ever used by the FBI Laboratory to include RFLP, DQA1, Polymarker, D1S80, and short tandem repeat analyses.
10. I have been a faculty member of the U.S. Department of Justice's National Advocacy Center in Columbia South Carolina, where I lecture on all aspects of DNA profiling to practicing state and Federal attorneys.
11. The FBI Laboratory nuclear DNA profiling unit, in common with other forensic laboratories throughout the United States, uses standard procedures to mathematically determine the significance when a DNA profile match occurs between crime scene evidence and an individual. The bases for these mathematical procedures can be found in "The evaluation of forensic DNA evidence / Committee on DNA forensic science: an update, Commission on DNA forensic science, an update, National Research Council." National Academy of Sciences, 1996. The significance of a DNA profile match can be expressed as the probability of selecting an unrelated individual at random (from one or more racial, ethnic, or geographic groups) having a DNA profile matching the DNA profile from an evidentiary item(s).
12. The mathematics used to calculate a random match probability are based on the use of population databases which relate DNA types and the frequencies with which these types occur. The data within these databases is fixed and is used solely for profile frequency estimates. In addition, the appropriateness of the population databases as representative of the population groups has been established through pertinent statistical tests and documented through publication in peer-reviewed journals. These data are available to the public on the world-wide-web. The FBI Laboratory nuclear DNA population data are used by other forensic laboratories throughout the United States. Essential to the establishment of a population database is that it not contain duplicate profiles and it not contain profiles of close relatives. Care is taken to purge population

databases of relatives and duplicate specimens. Inclusion of these categories of samples in a population database would mean that the DNA type frequencies would not be representative of a general population group and could not be used to calculate reliable random match profile frequencies.

13. A separate database system developed by the FBI is the Combined DNA Index System (CODIS). CODIS is an automated DNA information processing and telecommunications system that supports the National DNA Index System (NDIS), State DNA Index System (SDIS), and Local DNA Index System (LDIS). CODIS combines information from local, state, and national databases of DNA profiles derived from convicted felons, forensic evidence specimens, missing persons, and relatives of missing persons. By their nature, any of these databases can contain DNA profiles of individuals who are related to one another, or who are the same individual. These databases are used for determining possible linkages among forensic evidence specimens and individuals. Matches that ensue from such comparisons are considered to be investigative leads. Importantly, the CODIS databases are inappropriate for use in random match frequency calculations because relatives and duplicates are potentially present.

In the case of United States v. William Rue, the profile match was effected through a search of the FBI Laboratory equivalent to an SDIS, which combines the Federal Convicted Offender profiles developed by the FBI Laboratory and the FBI local forensic index profiles.

I swear that the above statements are true and correct.



 F. Samuel Baechtel, Ph.D.

Quantico, Virginia
 January 9, 2006

County/City of Stafford
 Commonwealth/State of Virginia
 The foregoing instrument was acknowledged
 before me this 9th day of January,
2006 by
F. Samuel Baechtel
(name of person seeking acknowledgment)
Sharon J. Crayler
 Notary Public
 My commission expires: May 31, 2008