

# Explaining Differential Trust of DNA Forensic Technology: Grounded Assessment or Inexplicable Paranoia?

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“What you see depends on where you stand”

—*Albert Einstein*

The aftermath of the 1965 Watts rebellion, book-ended by the dramatic images of burning cities and rioting and looting that continued for several days in Detroit and Newark, created two sharply contrasting images of the police in the American public's consciousness. The contrast was distilled in two bumper stickers: “The Police Serve and Protect the Community,” and “The Police are a Brutal Occupying Alien Force.” Depending upon the community where one lived, the number of vehicles displaying either message was quite predictable.

Similar feelings of trust and mistrust exist towards the American medical community. There is an abundance of evidence of the mistrust of clinical medicine among the US black population in the wake of revelations in 1971 of what came to be known as medical experiments on black men.<sup>1</sup> Even as early as the 1980s, the Tuskegee Syphilis Study had become so much a part of folklore among African Americans that few will be surprised to learn that Tuskegee continues to shape how many express deep suspicion of the medical profession.

It is less well known that a similar, perhaps even more deeply held suspicion exists among African Americans about the criminal justice system in general, and the police, in particular. The nation's profound shock after the O. J. Simpson verdict was announced is an effective example of this. After the verdict was read, cameras trained on audiences of white viewers showed shock, dismay and anger. But cameras trained on African Americans after the announcement showed people shouting affirmation, laughing, and hugging.

Just as Tuskegee has had far greater resonance and traction in cultural memory among African Americans than among whites, so the Rampart Police Scandal – uncovered in Los Angeles in 1999 – is the subject of far more barber shop talk along Martin Luther King Jr. Drive and Cesar Chavez Street than in the affluent suburbs and country clubs. In late 1999, and for nine months of ensuing testimony, it was revealed how police in the Rampart division of the Los Angeles Police Department planted drugs and guns on defendants – mainly African Americans and Latinos – then testified in court, under oath, that they had found these items, in

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order to secure convictions.<sup>2</sup> These machinations came to light only because a police officer working in a special unit of Rampart (Community Resources Against Street Hoodlums, or CRASH) began testifying against his fellow officers while awaiting re-trial on charges of stealing impounded cocaine. The officer, Rafael Perez, testified that he and other police officers had planted guns on suspects, fabricated drug evidence, and lied in arrest reports. As a result, more than 120 criminal defendants had their convictions vacated and dismissed, and more than \$42 million dollars has been paid in civil settlements.<sup>3</sup>

These accounts set the context for a discussion about DNA, genetic technologies, and crime fighting as it relates to the African American and Latino American communities. Without this discussion, we are left wondering how it is possible that some people see DNA evidence as definitive, while others maintain strong skepticism – that DNA technology, no matter how definitive, may not be used fairly in a criminal justice system that is tainted and sometimes corrupted. Thus African Americans and Latinos in the poorest neighborhoods in our major cities are far more likely to approach DNA evidence with a general mistrust,

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In the last ten to fifteen years, major police corruption scandals have come to light in Dallas, New Orleans, Philadelphia and Chicago. In Dallas, police framed thirty-nine Latinos and had them deported, by planting what they testified to be cocaine on them. This turned out to be powdered wallboard gypsum, not cocaine.<sup>4</sup> Also of interest is the infamous Tulia, Texas drug bust, where a corrupt police officer jailed and then helped convict nearly three dozen people by planting drugs and testifying against them. These convictions were later overturned when the governor pardoned thirty-five persons, and the police officer was indicted for perjury.<sup>5</sup> This came to national attention only after Bob Herbert kept up a steady stream of revelations in his column in *The New York Times*.

A few more examples should suffice to begin to fill in the contours of a suggestive national pattern, a mosaic of dotted lines that can be connected to provide at least a plausible account of suspicion. In the early 1990s, in Philadelphia's 39th police district, five officers pled guilty to setting up suspects, bribing witnesses, and planting evidence – resulting in the vacating of more than fifty convictions and an investigation of another several thousand arrests. Lynn Washington, legal scholar and Editor of the *Philadelphia New Observer*, recognized deeper issues involved in this case, stating “what’s most disturbing about the Philly corruption, is that the DA knew what the cops were up to, but tolerated their use of planted evidence because it boosted conviction rates.”<sup>6</sup> New York City police were rocked by a similar scandal, when sixteen officers of the Bronx 48th precinct were arrested and indicted “on charges ranging from falsifying evidence to stealing weapons and money from illegally-raided apartments.”<sup>7</sup>

for reasons including those described above. Indeed, it is possible to provide more reason for this skepticism by describing the basis for the different perspectives on just how “definitive” DNA testing has come to be perceived. On the one hand, there is the possibility of exoneration of someone convicted when analysis of the crime scene DNA does not match that of the person convicted. On the other hand, there is the arrest and conviction of a person not previously a suspect, when there is a match between that person’s DNA and the DNA found at a crime scene (known as a “cold hit”). We will take a closer look at both kinds of cases.

If DNA is the only evidence against the accused in the larger context of the framing scandals just described, we can see how some will fear the considerable abuse potential by rogue police officers doggedly committed to obtaining convictions. That is, if police can plant cocaine and guns on those that they later testify against, and obtain a conviction, they can *surely* plant DNA. The legitimacy of the criminal justice system rests primarily on fair application of laws. Who (or what part of society) would believe that police would actually plant DNA evidence, and even if they did, can DNA evidence ever stand alone without other circumstantial evidence? Before we turn to the differential trust issue, let us explore the nature of DNA technology and the claims made for degrees of certainty.

#### The Strong Case for Strong Claims of (Even Linked) DNA Evidence

In 2003, after serving eighteen years in prison, Darryl Hunt was exonerated and released from prison in North Carolina. Hunt was serving time for a rape and murder that had occurred in 1984. New analysis showed that his DNA did not match that left at the crime scene.<sup>8</sup>

Investigators hoped they could find a match for that DNA sample (“cold hit”) from the North Carolina convicted offender databank – which includes DNA from 40,000 individuals. Comparing the data from the 1984 crime scene against the 40,000 available DNA profiles, no perfect matches were found. However, the closest single match was to Anthony Dennard Brown, who matched on sixteen of the possible twenty-six alleles. Alleles associated with Short Tandem Repeats (STR) in DNA sequences are inherited in a way that the most likely explanation for a near perfect match is that the (DNA evidence) sample belongs to a close relative of the individual whose DNA profile is available. However, “while this information may prove to be useful to law enforcement investigators, relatively little has been done to establish the level and kind of similarity between evidence and non-matching database profiles sufficient to justify investigation of an individual’s relatives.”<sup>9</sup>

Because Anthony Dennard Brown matched only sixteen of twenty-six alleles, he was not a suspect. But this high proportion of matching alleles immediately cast suspicion on his close relatives – most particularly on his brother, Willard Brown. Police followed Willard Brown and confiscated a discarded cigarette butt of his for DNA testing. The laboratory found a perfect match at the thirteen-locus Short Tandem Repeats (all twenty-six alleles). Willard Brown was arrested, charged, confessed, pled guilty, and was convicted. He is now serving a life sentence, plus ten years.

While Great Britain’s Police Forensic Science departments routinely perform what they call “familial searches” of the variety just described, in the United States, there is a wide variety of state policies regarding familial searches. In the US, federal law bars the FBI from using DNA information from all but perfect matches. However, New York and Massachusetts encourage familial searches, authorized by specific state statutes. Dan Krane, one of the leading experts in DNA forensic technology,<sup>10</sup> notes that when they are permitted,

the thresholds of similarity that must be cleared before relatives are investigated tend to be ambiguously defined and described in terms such as matches needing to “be very, very close” (Virginia), “appear useful” (California) or be at 21 or more out of 26 alleles (Florida).<sup>11</sup>

The next case involves DNA as the sole piece of evidence that resulted in a conviction, thirty-five years after the crime was committed. Moreover, the way in which the case unfolded suggested that the laboratory that conducted the DNA analysis most probably made

a mistake. On March 20, 1969, Jane Mixer, a University of Michigan law student, was shot and strangled. There was no evidence of sexual assault, nor was there any semen from the perpetrator left at the scene. Thirty-five years later, in November, 2004, the police arrested Gary Lieterman, a sixty-two year old man whose DNA was in the database because of a fluke. Several years earlier, Lieterman had undergone neck surgery. He developed an addiction to pain killers. On one occasion when he could not obtain a physician’s signature in time for the next painful episode, he forged one to get a prescription. In Lieterman’s only brush with the law, he was remanded to drug treatment. His record was supposed to be expunged after his treatment was finished. However, his DNA was left in the database. This is not uncommon.<sup>12</sup>

Gary Lieterman would now become the subject of a bizarre turn of events that would generate an accusation that he killed Mixer thirty-four years earlier. In 2003, the DNA of two different men were allegedly found on the victim’s panty hose. One of the samples was Lieterman’s; the other sample was from someone who would have been four years old at the time of the murder. It turned out that this four-year old was in the database because he later murdered his own mother, in 2003.

Dan Krane, an expert witness for the defense, pointed out in his testimony what should have been obvious: that this was an instance of lab contamination. The same lab was handling the two murder cases at the same time. Although the prosecutor maintained that the DNA of the four-year old at the crime scene was not a mistake,<sup>13</sup> after only four hours of deliberation, the jury voted to convict Lieterman, who is now serving a life sentence.

### **Police Departments’ Organizational Imperative<sup>14</sup>**

There are powerful organizational motives for police departments to demonstrate effectiveness in solving crimes. It is a considerable embarrassment for a police department to have a long list of unsolved crimes on their books. No police chief wishes to face a city council with this problem. Thus, there are organizational imperatives for police departments to clean up their books by a procedure known as “cleared by arrest.” Few matters count as much as this when it comes to reporting to the public what police are doing.<sup>15</sup> To understand how arrest rates are influenced by “clearing,” it is vital to empirically ground this procedure by close observation.

Consider “P,” who is arrested and charged with burglary. There have been a number of other burglaries in this police precinct. The arresting officers see a pattern

to these burglaries, and decide that the suspect is likely to have committed a number of those on their unsolved burglary list. Thus, it sometimes happens that when “P” is arrested for just one of those burglaries, the police can “clear by arrest” fifteen to twenty crimes with that single arrest. “P” will be considered a “repeat offender,” even though there may never be any follow-up empirical research to verify or corroborate that “P’s” rap sheet accurately represents his crimes.

But only if one is “riding around in police cars,” or doing equivalent close up observation of police work<sup>16</sup> can crimes be proven to have a pattern. And yet, if social theorists take the FBI Uniform Crime Reports as a reflection of the crime rate, with no observations as to how those rates were calculated, they will make the predictable error of assuming that there are only a very small number of persons who commit a large number of crimes. This kind of bureaucratic decision-making generates a theory of “a few bad apples” where both the criminological theory and the policy decision leads one to look for the “kind of person” who repeatedly engages in this behavior. In fact, the long rap sheet is frequently generated by the imperative to “clear by arrest.”

The US prison population has undergone a dramatic shift in its racial composition in the last thirty years. The convergence of this social trend, to re-define race in terms of DNA will be a challenge at many levels – from the attempted re-inscription of race as a biological or genetic category, to attempted explanation of a host of complex social behaviors. That challenge can only be met by doing what the social researchers of a previous generation did with police work, namely, going to the very site at which those data are generated.

### Unreasonable Search and “Abandoned DNA”

To understand the historical and political context of the right of citizens outlined in the Fourth Amendment “to be secure in the persons, houses, papers, and effects, against unreasonable searches and seizures,” we must go back to the period when the British crown ruled the colonies. In this period, according to Chapin, an officer of the crown, armed with only the most general warrant for collecting taxes, could break down the door of a person’s home, enter, search for taxable goods, and seize whatever items appeared not to have been taxed, or what were called “uncustomed goods.”<sup>17</sup>

Today, the Fourth Amendment does not specify what constitutes “a reasonable search,” but most courts have interpreted this to hinge on the government’s requirement to obtain a search that is “warranted.” However, even without a warrant, a search is sometimes permissible. In issuing a warrant, the state must balance the “government’s special needs” against the individual’s right to personal privacy. “Special needs” for exam-

ple, encompass the safety of airline passengers, so the courts have ruled that it is permissible to test pilots for alcohol and other drugs, as well as bus drivers, train and subway operators, and so forth. Police also need to have other grounds for a warrant, such as the “suspicious behavior” of a suspect.

But a search can not include a general dragnet of those who exhibit no suspicious behavior – unless, of course, *that suspicious behavior is being in a population group that is thought to contain the likely suspect*. In such a circumstance, there is the “limited privacy expectation,” where the courts have ruled that ex-convicts have fewer protections of the expectation of privacy. In *Griffin v. Wisconsin*, the Court upheld a warrantless search.<sup>18</sup> The DNA Act of 2000 provided funds for states to expedite the admission of DNA evidence of crimes without suspects. The lower courts have been challenged on this, but have so far withstood the challenge, and the Supreme Court has yet to rule on it.<sup>19</sup> In late December 2005, the President of the United States acknowledged that he had authorized warrantless electronic eavesdropping on American citizens in the wake of the September 11, 2001 terrorist attacks.<sup>20</sup> It requires little speculation of which socially designated groups would be singled out for such invasions of their privacy. That is, just being in a group becomes “suspicious behavior.” Eavesdropping is aimed at those groups thought to be most likely to “harbor terrorists” or to be in contact with terrorists. The parallel, or perhaps analogy in the criminal justice system is the emerging practice of DNA dragnets. This is a recently developed police tactic, where all “likely suspects” in a wide geographical area around a crime scene are asked to provide a DNA sample in order to exclude them as suspects.

### DNA Dragnets

DNA dragnets originated in England, and are most advanced in Europe and the United Kingdom. The first DNA dragnet was conducted in Leicester, England in 1987. Two teenage girls were raped and murdered in the same area, and police requested voluntary blood samples from more than 4,500 males within a certain radius of the crime scene. When a man asked a friend to submit a DNA sample in his place, he immediately became a prime suspect, and turned out to be the killer.<sup>21</sup> Germany is the site of the largest DNA dragnet ever conducted. In 1998, the police collected samples from more than 16,000 people, and finally matched the DNA of a local mechanic to the sample collected at the crime scene of the rape-murder of an eleven year old.<sup>22</sup>

While the United States has only conducted about a dozen DNA dragnets, most notable about them is

their focus on specific racial groups. San Diego was among the first jurisdictions to conduct the practice, when, in the early 1990s, a serial killer stabbed six persons to death in their homes. The suspect was African American, and more than 750 African Americans were tested. In 1994, Ann Arbor, Michigan police obtained nearly 200 samples from African Americans in the hunt for yet another serial rapist and murderer. In both the San Diego and Ann Arbor cases, the suspect was apprehended and convicted for committing another crime, not as a result of the success of the dragnet. Then in 2004, Charlottesville, Virginia had a racially-driven dragnet that generated a controversial response

Deciding whether DNA might ever be “abandoned” is important, because as it is interpreted now, abandoned DNA provides the means to collect genetic information from anyone, at any time. The rules of criminal procedure law appear to pose no restrictions on this kind of DNA collection by the police.<sup>25</sup>

In the Lieterman case cited above, the defendant was convicted of murder with a single DNA sample putatively left at the crime scene. Since everyone “abandons” their DNA all the time, it is quite easy to obtain samples from anyone. So the question remains, why would anyone suspect officers of the criminal justice system to commit fraud or perjury, or to plant evidence? The answer, sociologically, is that this “anyone” is not a random person, but rather, is predictably located in the very social groups that have been the subjects of unwarranted searches and seizures, and of systematic victimization

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from civil liberties groups, that ultimately convinced the police to temporarily abandon, and ultimately revise and restrict the dragnet strategy.<sup>23</sup> A serial rapist had been active in the Charlottesville area for six years, from 1997 through 2003, frustrating police investigations at every turn. The DNA evidence linked the rapist to at least six assaults. From a number of leads, the police believed the rapist to be African American, and so in the winter of 2003, the chief of police initiated a project to obtain saliva samples from 187 men – 185 of whom were black (the two others were Latinos).<sup>24</sup> However, when two men, both students at the University of Virginia, refused, they raised the whole issue of what constitutes voluntary submission of a DNA sample. In so doing, they brought pressure on both the university and the local black community to take a position. The Dean of the University of Virginia’s Office of African American Affairs organized a forum to discuss the situation – drawing national media attention. At one point, the Dean said: “Because the suspect is black, every black man is suspect. What are we going to do about this in the community?” In mid-April of 2004, the police chief suspended the dragnet, and restricted its use to a much narrower use of police discretion based more on whether a suspect resembled a composite profile than on race.

In addition to a DNA dragnet, police have another tactic available to them, as revealed in the Willard Brown case cited at the beginning of this paper. After a person has become a suspect, the police can literally follow that person around and collect samples of their “abandoned” DNA. In a recent paper, Elizabeth Joh addresses the apparently limitless capacity to pursue this technique for acquiring DNA samples:

of police corruption. Moreover, the “anyone” who expresses a belief that the police would not engage in such activities, except as “rogue cops,” is also predictably more likely to reside in middle and upper class communities – where the police tend to be experienced as those who “serve and protect.” In communities in which the police are experienced as a brutal occupation force, antipathy to the whole system of criminal justice can be expected. This was the logic of the Dallas prosecutor’s office, which as part of its staff training, instructed all staff prosecutors to preemptively challenge African Americans in death penalty cases. “A Dallas County district judge testified that, when he had served in the District Attorney’s Office... his superior warned him that he would be fired if he permitted any African Americans to serve on the jury.”<sup>26</sup>

### The Push to Expand DNA Databanks beyond Convicts and Arrestees

The United Kingdom has been in the vanguard of expanding DNA databases, but other countries may soon surpass it.<sup>27</sup> In April, 2004, a law was passed in the UK permitting police to retain DNA samples from anyone, arrested for any reason, including people not charged with a crime. Anyone can have their DNA taken and stored. The database already contains 2.8 million DNA “fingerprints” taken from identified suspects; plus another 230,000 from unidentified samples collected from crime scenes.<sup>28</sup> Samples are being added at the rate of 10,000 to 20,000 per month.<sup>29</sup> The goal is to have, on file, a quarter of the UK adult population’s DNA, a figure that exceeds ten million – making it by far the largest DNA database in the world.

### **Ancestral Informative Markers – Identifying Race from Inside the Body (via DNA Markers)**

In the last decade, using technologies of molecular genetics, remarkable claims are being made in the scientific literature, for example that it is possible to “estimate” the race of a person by looking at specific markers in the DNA.<sup>30</sup> The social implications of this reach far beyond personal recreational usage, where a person could submit a DNA sample and “discover” the percentage of ancestry that comes from Europe, Sub-Saharan Africa, or the Asian continent.<sup>31</sup> Forensic applications of this technology are being touted and marketed, the direct consequence of a successful intervention in a sensational serial rape-murder case. In early 2003, police in Baton Rouge, Louisiana had been unsuccessful in attempts to identify a serial rapist-murderer, after interviewing over 1,000 white males who fit what one witness described as the likely suspect. A tissue sample with DNA was analyzed by a company that claimed it could discern that the suspect (based upon the DNA analysis) was eighty-five percent African ancestry.<sup>32</sup> When the prime suspect was apprehended, he turned out to be an African American, and the company that did the test has since been advertising on its website about its success, and has attempted to market their expertise to police departments around the country. Yet another claim about the capacity to use DNA to identify race appeared in 2005, in the *American Journal of Human Genetics*. Hua Tang and colleagues wrote that “genetic cluster analysis of the microsatellite markers produced four major clusters, which showed near-perfect correspondence with the self-reported race/ethnic categories.”<sup>33</sup> This was followed by Stanford University’s release of the following statement to the press: “A recent study conducted at the Stanford Medical School challenges the widely held belief that race is only a social construct and provides evidence that race has genetic implications.”<sup>34</sup>

### **Expanding DNA Databases while Honing-in on Putative Racial Markers**

In 1994, Congress passed the DNA Identification Act, authorizing the FBI to establish a national DNA database, the Combined DNA Index System (CODIS). Even as late as the mid 1980s, most states were only collecting DNA samples from sexual offenders. Within a decade, all fifty states were contributing DNA samples to the CODIS system on a wide range of felons, with the capacity to inter-link state databases.

In just three years, the CODIS database has grown from a total of nine states cross-linking “a little over 100,000 offender profiles and 5,000 forensic profiles,” to include thirty-two states, the FBI, and the US Army, linking “nearly 400,000 offender profiles, and close to

20,000 forensic profiles.” States are now uploading an average of 3,000 offender profiles every month.<sup>35</sup> If this sounds daunting, keep in mind that computer technology is increasingly efficient and extraordinarily fast – it takes only 500 microseconds to search a database of 100,000 profiles.

The expansion of the databases is inevitable. At the state level, in 2004, California voters passed Proposition 69, permitting collection and storage of DNA by 2009 for those *merely arrested* for a select number of crimes, joining Louisiana, Texas and Virginia.<sup>36</sup> Also, the recently enacted federal DNA Fingerprint Act of 2005 now authorizes the collection of DNA from citizens arrested for qualifying federal offenses, and from non-U.S. individuals who are merely “detained” under federal authority.<sup>37</sup>

As we increase the numbers of profiles in the databases, researchers will propose providing DNA profiles of specific offender populations. Twenty states authorize the use of databanks for research on forensic techniques.<sup>38</sup> In another essay published here, Tania Simoncelli<sup>39</sup> analyzes the civil liberties implications of the federal DNA Fingerprint Act of 2005, passed as part of the reauthorization of the Violence Against Women Act. In addition to the expansion noted above, this legislation expands CODIS further still, allowing states to upload DNA profiles from anyone whose DNA samples are collected under applicable legal authorities, eliminating prior protection that prevented the collection and storing of DNA profiles from arrestees who have not been charged.<sup>40</sup>

All of this shows an ever-expanding national forensic DNA database. Coupled with an increasing commitment to use DNA to estimate racial identity to reduce the number of suspects that are needed in a mass screening program,<sup>41</sup> we can see the ingredients for what Wacquant has called a deadly symbiosis.<sup>42</sup> Sixty-two percent of all prisoners incarcerated in the United States are either African American or Latino,<sup>43</sup> while these populations comprise only about a quarter of the nation’s entire population. The police scandals in major cities show a remarkable pattern of abusive treatment of the members of the poorest communities of African Americans and Latinos. Most significantly, planting evidence has become a common theme in many of these abuse scandals. When we add to this mix the increasing tendency for the molecular re-inscription of race, with “ancestral informative markers” as a product now being sold (lobbied, and hyped) by the inventors of this technology to police departments, the emergence of DNA dragnets (which will inevitably become racially focused in a society in which race creates stratification), and a national DNA forensic database that is expanding to include even those just arrested – none of

this seems to generate suspicion or caution in one part of the society, but in another part of society, agitation, distrust and suspicion are palpable. How to explain these sharply different responses to developments in DNA technology and forensics? Rather than reducing the answer to either misguided mistrust or paranoia – or alternatively, rather than explaining blind trust in the technology as naiveté, it is probably the better analytic strategy to invoke Einstein’s insight, that “what you see depends on where you stand.”

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33. H. Tang, et al., “Genetic Structure, Self-Identified Race/Ethnicity, and Confounding in Case-Control Association Studies,” *American Journal of Human Genetics* 76 (2005): 268-275.
34. J. Zhang, “New Study Links Race and DNA Material,” Friday, February 4, 2005, available at <[http://daily.stanford.edu/tempo?page=content&id=15971&repository=0001\\_article](http://daily.stanford.edu/tempo?page=content&id=15971&repository=0001_article)> (last visited March 13, 2006.)
35. D. Gavel, “Fight Crime through Science,” *Harvard Gazette*, November 30, 2000.
36. “DNA Fingerprint Act of 2005” was signed into law on January 6, 2006 as Title X of the Violence Against Women Act and Department of Justice Reauthorization Act, Pub. Law 109-162, 119 Stat. 2960.
37. SEC. 1004. AUTHORIZATION TO CONDUCT DNA SAMPLE COLLECTION FROM PERSONS ARRESTED OR DETAINED UNDER FEDERAL AUTHORITY.
  - (a) In General- Section 3 of the DNA Analysis Backlog Elimination Act of 2000 (42 U.S.C. 14135a) is amended—(1) in subsection (a)
    - (A) in paragraph (1), by striking “The Director” and inserting the following:
    - (A) The Attorney General may, as prescribed by the Attorney General in regulation, collect DNA samples from individuals

- who are arrested or from non-United States persons who are detained under the authority of the United States.
38. J. Kimmelman, "Risking Ethical Insolvency: A Survey of Trends in Criminal DNA Databanking," *Journal of Law, Medicine & Ethics* 28 (2000): 209-221.
39. T. Simoncelli, "Dangerous Excursions: The Case Against Expanding Forensic DNA Databases to Innocent Persons," *Journal of Law, Medicine & Ethics* 34 (2006): 390-397. See also in this issue, H. Greely, et al., "Family Ties: The Uses of DNA Offender Databases to Catch Offenders' Kin," *Journal of Law, Medicine & Ethics* 34 (2006): 248-262. For an examination of the implications of familial DNA database searching in light of the disproportionate number of African-Americans in U.S. forensic databases. The authors, noting the disproportionate number of African-Americans in the CODIS database, state, "...the way that family forensic DNA puts African-Americans under much greater investigative scrutiny may not be unconstitutional, but seems unfair and quite possibly unwise." *Id.*, at 260.
40. Pub. Law 109-162, 119 Stat. 2960, codified at 42 U.S.C. §14132(a)(1) (2005). The amendment retains the prohibition on inclusion of samples voluntarily submitted solely for the purpose of elimination. *Id.*
41. See Lowe, *supra* note 28.
42. L. Wacquant, "Deadly Symbiosis: When Ghetto and Prison Meet and Mesh" *Punishment and Society* 3, no. 1 (2000): 95-134. Reprinted in D. Garland, ed., *Mass Imprisonment: Social Causes and Consequences* (London: Sage, 2001): 82-120.
43. S. R. Gross, et al., "Exonerations in the United States, 1989 through 2003," Unpublished manuscript, *University of Michigan Law School* (2004) available at <<http://www.law.umich.edu/newsandinfo/exonerations-in-us.pdf>> (last visited March 14, 2006).
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