DNA Fingerprinting and Civil Liberties:
Second in a Series of Articles

In the provocatively titled article, "California's Proposition 69: A Dangerous Precedent for Criminal DNA Databases," Barry Steinhardt and Tania Simoncelli of the American Civil Liberties Union, explore the implications of this new statute for civil liberties and public safety. Given its status as the most populous state, the inclusion of all arrestees within its databank will make California's mandate the most significant and costly state-based expansion to date. Whatever one's views on the appropriate size and function of forensic DNA databanks, all eyes will be on California as its experience with the new law unfolds. Thus, it is with great pleasure that we publish this important article as the second in a series of scholarly articles to come out of ASLME's DNA Fingerprinting and Civil Liberties Project.

The DNA Fingerprinting and Civil Liberties Project has been made possible thanks to a generous grant, Grant No. 1R01 HG002836-01, from the National Human Genome Research Institute of the NIH. With this funding, ASLME has undertaken a multi-year exploration of ethical, legal, and social issues arising from the use of forensic DNA profiling. Future articles in this series will examine the issue of privacy, race and genetics, ethical approaches to research using samples from mass disasters, legal issues and forensic science, law and policy of forensic DNA databanks in the United Kingdom, current forensic DNA databank laws in the U.S., and many other salient topics.

For a complete description of the goals of the project, including ASLME Reports on related state and federal cases and statutes, information on the workshop series, and the national symposium to be held in May of 2006, visit our web site, www.aslme.org.

California's Proposition 69: A Dangerous Precedent for Criminal DNA Databases

Tania Simoncelli and Barry Steinhardt

On November 2, 2004, California voters approved Proposition 69, "The DNA Fingerprint, Unsolved Crime, and Innocence Protection Act" by a margin of approximately 60 to 40 percent.[1] Given the limited amount of information provided to voters during the initiative process, it is unclear how many of the yea-sayers were apprised of the full implications of this measure. Indeed, by voting "yes" on Proposition 69, California has elected to house the most radical and costly state criminal DNA database in the country. This dangerous expansion of California's database poses tremendous threats to civil liberties and social justice while offering little, if anything, by way of increasing the safety of its citizens.

Prior to November 2, California law required the permanent retention of DNA samples from felons convicted of serious, violent crimes. The new law expands the database to include DNA samples from all felons and individuals with past felony convictions – including juveniles – and, beginning in five years, all adults arrested for any felony offense. The inclusion of DNA samples from people who have merely been arrested is particularly egregious and establishes a highly dangerous precedent.

California's DNA database is only one of many forensic DNA databases in the U.S. and abroad that

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has expanded in size and function. However, California's massive area and population render changes made to its database particularly significant. Thirty-four million people reside in California – a full thirteen percent of the entire United States population. Changes made to California's law are also especially important due to the state's propensity to establish national legal precedents. For example, California's air quality standards and tax reduction laws have been widely copied throughout the United States.

The following article analyzes California's new database law within the context of the history and development of criminal DNA databases in the United States. We begin with a basic analysis of the initiative and the process of its passage. We then discuss the development of California's law within the broader trends of DNA database expansion in size, function, and categories of tested individuals. Finally, we provide a detailed critique of Proposition 69, including its treatment of arrestees and suspects and the ways in which it will likely increase error rates in testing, exacerbate racial bias and existing privacy concerns, and burden California taxpayers.

I. PROPOSITION 69: A RADICAL EXPANSION OF CALIFORNIA'S DATABASE

On December 9, 2003, Bruce Harrington, an attorney and real estate developer of Newport Beach, CA, submitted a proposed ballot initiative to the California State Attorney General's Office.[2] Entitled the "DNA Fingerprint, Unsolved Crime and Innocence Protection Act," the proposal sought to expand dramatically California's criminal DNA database.

Harrington had tragically lost his brother and sister-in-law to an unknown serial killer in 1980. Convinced that a more inclusive criminal DNA database would lead to the resolution of the crime, he spent $1.3 million of his own money to fund the collection of the 373,816 signatures required for the initiative to be considered on the November 2004 ballot.[3] Harrington succeeded in obtaining the signatures, and, following several months of aggressive campaigning, the initiative was approved by 6,675,000 California voters on November 2, 2004.[4]

Proposition 69 marks a radical expansion of California's law governing criminal DNA databases. Like most other U.S. states, California's database was established in 1998 with the purpose of housing DNA profiles from criminals convicted of very serious, violent crimes, such as murder and rape. As of September 2004, 220,000 Californians had been forced to have their DNA extracted and permanently retained.[5]

The newly enacted law will require collection and retention of DNA samples from a far broader range of individuals:

- All persons, including juveniles, convicted of *any felony offense;*[6]
- All persons, including juveniles, convicted of *any sex offense, including misdemeanors;*[7]
- All persons, including juveniles, who are *in prison, or on probation or parole with a record of a past or present conviction of any qualifying offense;*[8]
- All adults *arrested for murder or rape;*[9]

And, starting five years from enactment:

- All adults *arrested for any felony offense.*[10]

The sheer number of people that will undergo DNA testing under this new law is staggering. We estimate that *in just this first year of its enactment, well over 600,000 people in California will qualify for DNA testing.* These include all adult felons not already in the database, juvenile felony adjudications, misdemeanant sex offenders, and adults arrested for murder or forcible rape in 2005, plus all of those currently in the criminal justice system – in prison, on parole, on probation, or in county jails – with a past record of a felony. Here is how we arrived at this estimate:

Table 1

Number of Persons in Categories that Qualify for DNA Testing in 2005

Category	Number of Persons (based on 2002 statistics)[11]
Felony Convictions (adults)	172,000[12]
Felony Adjudications (juveniles)	53,000[13]
Felon Prisoners	157,000[14]
Felon Parolees	118,000[15]
In County Facilities	76,000[16]
Adult Felony Probationers	240,000[17]
Misdemeanor Sex Offenders	6,000[18]
Adults Arrested for Murder or Forcible Rape	4,000[19]
Total	**826,000**

A portion of the prisoner, parolee, and jail populations with past felony convictions have already undergone testing under the previous law (e.g. those who had been convicted of serious, violent felonies). Similarly, a portion of the adults arrested for murder or forcible rape each year are ultimately convicted and accounted for in the total number of "felony convictions." We adjusted these figures to account for such overlap as follows:

Table 2
Number of Persons Who Will Qualify for DNA Testing in 2005

Category	Number of Persons (2002)	Adjustment	Adjusted Estimate
Felony Convictions (adults)	172,000	All 2005 felons will be added to the database	172,000
Felony Adjudications (juveniles)	53,000	All 2005 felony adjudications will be added to the database	53,000
Felon Prisoners	157,000	Less 50% felons already tested under previous law (in prison for serious, violent crimes)[20]	79,000
Felon Parolees	118,000	Less 25% parolees already tested (convicted of serious, violent crimes)[21]	89,000
In County Facilities	76,000	Assume 25% with past felony conviction qualify for testing[22]	19,000
Felony Probationers	240,000	All qualify as new additions[23]	240,000
Misdemeanor Sex Offenders	6,000	All qualify as new additions	6,000
Adults Arrested for Murder or Forcible Rape	4,000	60% of those arrested are not convicted and qualify as new additions	2,000
Total	**826,000**		**660,000**

According to our estimate, well over 600,000 people – including more than 50,000 juveniles – will qualify for testing under Proposition 69 in just the first year of its enactment. This figure represents more than ten times the number of samples the California Department of Justice (CA DOJ) has ever processed in a given year,[25] and three times the total number of offender profiles that were in the database at the time of Proposition 69's passage.[26]

This tidal wave of new testing requirements will undoubtedly produce a massive new backlog in testing. Assuming that backlog can ever be cleared up, ongoing testing under the initiative will continue to add hundreds of thousands of DNA profiles to the database each year consisting of new felons, juvenile adjudications, and others who get caught in the system with a past record of a felony.

Starting in 2009, all adult felony arrestees will also be added to the database. In 2002, approximately 426,000 adults were arrested for felony offenses.[27] Approximately 256,000 of these felony arrestees – 60 percent – will not ultimately be convicted of any crime, and thus will constitute entirely new additions to the database.[28] As years go by, the number of felony arrestees new to the system requiring testing could decrease, but only if a mechanism is put in place to prevent duplicate testing of re-arrests.

In sum, in the next year, well over 600,000 people will qualify for testing under California's new law. After that, we can expect a couple hundred thousand people to continue qualifying year after year, and starting in 2009, this number could more than double when arrestees are added to the database.

Our estimate is not inconsistent with that of the California Legislative Analyst's Office (LAO), which estimated that the measure would result in the analysis of up to 400,000 additional samples, annually.[29] While we believe more people will *qualify* for testing in the first year, we do not believe all of these people will necessarily be tested. At a recent state legislature hearing on Proposition 69, the head of California's Bureau of Forensic Services stated that California's DNA Laboratory currently faces a backlog of somewhere between 60,000-80,000 unprocessed samples.[30] It seems extremely unlikely that CA DOJ will be able to meet the demand created by a receipt of ten times that number of samples in just one year.

In addition to expanding the database and creating a new backlog, Proposition 69 contains several significant changes to the way in which DNA samples are handled. For example, it removes an existing provision in the law requiring the California Department of Justice to routinely purge profiles that do not belong in the database. Instead, a person who is no longer a

suspect for a crime or whose DNA is inadvertently placed into the database now has to follow a complicated procedure to request having their DNA and all related information expunged. Similarly, while under previous law, DNA taken from suspects could only be compared to the crime scene evidence for the relevant investigation, the law will now allow for such samples to be compared to any available database and with any investigation or case, and retained for up to two years.[31] We provide a detailed critique of these provisions, below.

II. HISTORICAL TRENDS IN U.S. CRIMINAL DNA DATABASES: A PATTERN OF "FUNCTION CREEP"

The significance of California's "DNA Fingerprint, Unsolved Crime, and Innocence Protection Act" can only be understood within the context of the rapid historical progression of state databank laws. The earliest state statutes that created DNA banks date back to the early 1990s. By 1998, all fifty states had authorized criminal DNA databases.

In addition to the state databases, Congress created a federal law – the "DNA Identification Act of 1994" – authorizing the FBI to maintain a centralized, national DNA database and to develop a software system to allow for the sharing of information within and between the states. The resulting system – the Combined DNA Index System (CODIS) – enables state and local authorities to share DNA profiles collected at local, state and national levels. By 2004, all fifty state databases were connected by CODIS. As of September 2004, CODIS housed 1,885,776 offender DNA profiles.[32]

The past decade has witnessed a dramatic expansion of U.S. criminal databases in both size and function. While the earliest state statutes of the 1990s explicitly limited the databases to retaining profiles from sexual offenders – on the theory that they are likely to be recidivists and frequently leave biological evidence – most states have expanded their databases in the last few years to include DNA samples from additional categories of individuals. Today, thirty-four states collect DNA from all felons, twenty-eight from juvenile offenders, and thirty-eight from those who commit some categories of misdemeanors.[33] In addition to California, three states have moved beyond convicted criminals. Virginia requires DNA samples to be collected from anyone arrested for a violent felony.[34] Similarly, Texas law authorizes collection of DNA from individuals indicted for certain felonies, as well as certain arrestees previously convicted for specified offenses.[35] Louisiana has authorized, but apparently not yet implemented, DNA testing for persons who have been arrested for any felony.[36]

California's database law has demonstrated a similar trend. First enacted in 1998 as the "Forensic Identification Data Base and Data Bank Act," the law required collection of DNA from any person convicted of an attempt or commission of serious, violent felony offenses of the following categories: sex offenses; murder; voluntary manslaughter; spousal abuse; aggravated sexual assault of a child; specified assault or battery; kidnapping; mayhem; and torture.[37] By 2002, the list of qualifying offenders had expanded to include burglary, robbery, arson, carjacking, and terrorist activity.[38] Passage of Proposition 69 expanded collection to all felons – including those with past convictions – and made California the second state to authorize collection of DNA from all felony arrestees.

The rate of state database expansion is not likely to slow. In 2003, alone, eighteen states passed laws to amend their statutes to include more categories of people in their databases, such as all felons, all criminals, misdemeanants, prostitutes, terrorists, those serving community sentences, immigration violators, and arrestees.[39] Seven state legislatures considered legislation to broaden their databases to include arrestees.[40]

The expansion of FBI's authority to include DNA collected from virtually any person who is eligible for testing under state law will inevitably result in a database that goes far beyond convicted criminals.

The national database has also expanded, most dramatically by the recent enactment of the "Justice For All Act" on October 30, 2004. Prior to that, the national database housed DNA samples only from persons convicted of sex offenses and other serious, violent crimes. Similarly, states could only upload to CODIS DNA profiles from offenders of these categories. The new law changed the definition of "federal qualifying offense" to include "any felony." In addition, it allowed states to begin uploading to CODIS DNA profiles from any of the following:

a) Persons convicted of crimes;
b) Persons who have been charged in an indictment or information with a crime; and
c) Other persons whose DNA samples are collected under applicable legal authorities, provided that DNA profiles from arrestees who have not been charged in an indictment or information with a

> crime, and DNA samples that are voluntarily submitted solely for elimination purposes shall not be included in the National DNA Index System.[41]

The sheer magnitude of the potential growth of the central database from this change is worth noting. According to the FBI, about 1.4 million violent crimes are committed each year in the United States.[42] By contrast, over 10 million property crimes are committed,[43] the majority of which would be considered felony offenses under state laws. In 2002, U.S. law enforcement made an estimated 1.6 million property crime arrests.[44] Felony offenses would also include some portion of crimes in other categories, such as forgery, fraud, embezzlement, vandalism, and drug abuse, which account for over 2 million additional arrests each year.[45]

Under California's new law, even those arrested and later proven innocent or a victim of mistaken identity will have their DNA seized and stored in a government database alongside those of murderers and rapists.

The expansion of FBI's authority to include DNA collected from virtually any person who is eligible for testing under state law will inevitably result in a database that goes far beyond convicted criminals. Starting in 2009, DNA profiles of all of California's arrestees who are charged with a crime as a result of an indictment or information – even if they are ultimately proven innocent – will be uploaded into CODIS. The same will be true for the other three states that have started to allow collection of DNA from arrestees.

Recent trends indicate that people who aren't even suspected in any way of a crime may end up in databases. Last year, Louisiana passed a law requiring DNA samples from new police applicants.[46] In 1999, then-New York City Mayor Rudolph Giuliani proposed collection of DNA samples from all newborns for both medical and law enforcement purposes.[47] A similar proposal was made in Michigan.[48] It is not far-fetched to imagine that states may decide to routinely collect DNA from day-care providers, public school teachers, immigrants, truck drivers, or any other category of people whose catalogued DNA profile might be justified on the basis of safety precautions or merely identification purposes.

In sum, in a very short time, we have witnessed the ever-widening scope of the target groups from whom law enforcement collects DNA and rapid-fire proposals to expand the populations to new and ever greater numbers of persons. This trend of rapid expansion in size and function heightens existing concerns that these massive amounts of aggregated data could be misused. While a DNA data bank for criminal identification purposes sounds like a laudable goal, will we hold the line and ward off the temptation to expand its use to non-forensic purposes?

Unfortunately, the answer to this question is probably not. Our country's databases have a long history of "function creep" – databases created for one discrete purpose, despite the initial promises of their creators, eventually take on new functions and purposes. In the 1930s, assurances were made that the Social Security numbers would only be used as an aid for the new retirement program, but over the past sixty years they have gradually become the universal identifier that their creators claimed they would not be. In a more sinister episode in our nation's history, census records created for general statistical purposes were used during World War II to round up innocent Japanese Americans and to place them in internment camps. And since September 11, we have witnessed the private sector's sharing of information on consumers with the Department of Homeland security.[49]

A pattern of "function creep" is already emerging with regard to criminal DNA databases. Actions and proposals to include arrestees – many of who are innocent – and other populations of individuals who are not criminals represent a radical shift in the purpose and intent of these databases. In addition, approximately ten states have no rules that require the expungement of DNA records upon reversals of convictions.[50] No longer is it accurate – or honest – to refer to many state databases as "criminal databases" since they include DNA samples from people who have not been convicted of any crime. The likelihood that "function creep" will occur with regard to the uses of stored DNA profiles is already built into many state laws. At least twenty-eight states allow DNA samples that have been collected for law enforcement identification to be used for a variety of non-law enforcement purposes.[51] Thirteen of these state laws include a vague, open-ended authorization that allows the database to be used for "other humanitarian purposes."[52] Alabama's statute explicitly authorizes the creation and use of a DNA population statistical database "to provide data relative to the causation, detection and prevention of disease or disability," as well as to assist in educational or medical research.[53]

Yet another form of "function creep" is starting to emerge, where DNA analysis and database information is beginning to be used in new ways to create suspects when none are generated through a "cold hit." In a murder investigation in Louisiana, for example, a relatively new method of DNA analysis was employed to predict the "ancestry" of the offender as 85 percent Sub-Saharan African and 15 percent Native American. The company that performed the analysis, DNAPrint Genomics, has been aggressively marketing the service to police departments, investigators, and agencies.[54] The company has also recently started offering to law enforcement agencies a genetic test to infer eye color.[55]

"Familial searching" of databases is another new method of creating suspects in the absence of an immediate "cold hit." "Familial searching" is premised on the notion that siblings and other closely related individuals share more common genetic material that nonrelated individuals. The technique involves looking for a "partial match" between DNA specimens taken from the crime scene with those in an offender database. Such a "partial match" might indicate a close family member of the person who's DNA was left at the scene of the crime.[56] Familial searching has already been employed in the United Kingdom in at least twenty criminal investigations.[57]

Concerns about inappropriate uses of DNA collections are heightened by the fact that there is not one state or federal statute that requires that biological samples collected for identification purposes be destroyed after identification testing is completed.[58] While law enforcement authorities would like us to believe that the samples will never be used for anything besides catching criminals, an unlimited span of improper uses remain plausible so long as those samples are retained. Compounding this problem is that few laws prohibit genetic discrimination by employers, insurers or medical care providers.[59] As more DNA is collected, and as advances in genetic research "up the ante" on its informational value, instances of discrimination and misuse will grow as well.

III. A CRITIQUE OF PROPOSITION 69

Proposition 69 is highly problematic on several accounts. These include the new law's inappropriate treatment of arrestees and suspects, its likelihood to exacerbate racial bias, error rates in DNA testing, and privacy concerns, and its tremendous costs that will ultimately be born by California taxpayers.

Inclusion of Arrestees

Proposition 69's most troublesome provision is its requirement to collect and retain DNA samples from all felony arrestees. Storing DNA taken from individuals who have not been convicted of a crime in a criminal database undermines the principle of presumptive innocence and sets a chilling precedent for data collection by the government of its citizens.

Every year in California, approximately 50,000 people are arrested for felonies – including shoplifting and writing a bad check – and never charged with a crime. Thousands more are tried and never convicted. Similarly, a national survey of the adjudication outcomes for felony defendants in the seventy-five largest counties in the country revealed that in felony assault cases, 50 percent of charges were dismissed outright, and 14 percent were reduced to a misdemeanor.[60] Under California's new law, even those arrested and later proven innocent or a victim of mistaken identity will have their DNA seized and stored in a government database alongside that of murderers and rapists.

Arrest does not equal guilt and a person shouldn't suffer the consequences of guilt unless and until he or she has been convicted. To find otherwise is to empower police officers, rather than judges and juries, with the power to force persons to provide the state with evidence that harbors many of their most intimate secrets and those of their blood relatives.

The testing and retention of DNA samples obtained from an arrestee or innocent individual is an intrusive, unreasonable search made without the individualized suspicion required by the Fourth Amendment and analogous provisions of state constitutions. In general, U.S. courts have ruled that DNA databanking for convicted felons is permissible for one of two reasons: 1) because a "special need" is present where persons have been convicted of crimes with high recidivism rates and the presence of biological evidence, like sexual assaults;[61] or 2) because convicted felons have a "diminished expectation" of privacy.[62] But even if one accepts the court rulings that DNA data banking for convicted felons is permissible for one or both of these reasons, neither of these circumstances applies to persons who have simply been arrested.

There are ample means at the disposal of law enforcement officials for confirming an arrestee's identity. It cannot be argued that forcing arrestees to provide DNA samples serves any legitimate security concern, even if they are in pre-trial detention. Nor by definition can it be used to insure compliance with any specified term of post-conviction supervised release. Put simply, these persons have not been convicted of any crime and may never be. The only possible justification is investigatory and if law enforcement has reason to suspect an individual arrestee than it can and should seek a warrant.

Taking DNA samples from arrestees is one problem – retaining them indefinitely is yet another. Proposition 69 does not provide a way to ensure that DNA samples and associated records from persons who are arrested and then proven innocent are expunged. The responsibility should rest with the databank to make sure that DNA samples that do not belong in a database are removed. Instead, Proposition 69 places the onus on the innocent person to get their DNA back.[63] Specifically, that person would have to send a formal request (undoubtedly requiring assistance from a hired lawyer) to three different offices – the trial court of the county in which he or she was arrested; the California Department of Justice's DNA Laboratory; and the prosecuting attorney of the county in which s/he was arrested.[64] In addition, if the court denies the request, no appeal process is available.[65]

Many innocent arrestees will not only have to contend with California's database; they may also find themselves caught in CODIS, since, under the recently amended federal law, states are allowed to upload DNA profiles from persons charged in an indictment or information with a crime.[66]

Treatment of Suspects

Also alarming is Proposition 69's treatment of suspects. Previously, California law required that DNA obtained from suspects could only be compared to the case in question, and could not be placed into the database. Proposition 69 removes these protections. In addition, suspect DNA – including that which is voluntarily provided – will be retained for up to two years and compared:

> In and between, as many cases and investigations as necessary, and searched against the forensic identification profiles, including DNA profiles, stored in the files of the Department of Justice DNA data bank or database or any available data banks or databases as part of the Department of Justice DNA Databases and Data Bank Program.[67]

This provision is especially problematic in light of the increasing use of "DNA dragnets" or "DNA sweeps." These are searches that involve the collection and analysis of DNA from individuals who fit a general description or profile of the suspected offender. In these cases, police investigators round up hundreds if not thousands of individuals and ask them to "voluntarily" provide a DNA sample.

DNA sweeps raise profound civil liberties concerns because they involve collecting DNA from people without probable cause. In addition, the claim by law enforcement that dragnets are truly "voluntary" has been widely criticized; for example, declining to "volunteer" has left individuals subject to social stigmatization or coercion or forcible collection of their DNA.[68] Finally, in some cases, even after individuals are cleared of the crime in question, they have not been able to get their DNA back. At least two lawsuits – in Michigan[69] and Louisiana[70] – have arisen from denied requests to have DNA returned to individuals who have "volunteered" their DNA.

Of nineteen cases in the United States that are known to have involved a DNA dragnet, five occurred in California.[71] A DNA dragnet in the context of Proposition 69 gives rise to a troubling paradox: an individual who "voluntarily" provides a DNA sample as proof of innocence will by that very donation be rendered a suspect in future cases (at least for two years); an individual who refuses to provide a sample automatically becomes a "suspect" and will likely be forced or coerced into providing a sample anyway. Either way, anyone swept up in a DNA dragnet in California should expect that they will not be able to get their DNA back for at least two years, and that their DNA profile will be compared to as many investigations and with as many databases as are available.

Exacerbation of Racial Bias

Unfortunately, there is a disturbing element of racial disparity that runs throughout the U.S. criminal justice system[72] that will only be compounded by Proposition 69's implementation. A study released by the California State Assembly's Commission on the Status of African American Males in the early 1990s revealed that 64 percent of the drug arrests of whites and 81 percent of Latinos were not sustainable, and that an astonishing 92 percent of the black men arrested by police on drug charges were subsequently released for lack of evidence or inadmissible evidence.[73]

Similar problems have been uncovered in other states. The State of New Jersey has conceded that its state police engage in racial profiling over a period of at least ten years in incidents that included the recent shooting of four unarmed black teenagers and were documented by nearly one hundred thousand pages of state police memoranda, reports, and other papers.[74] The problem was determined to be so serious that the state entered into a consent decree with the Department of Justice that, among other things, barred police officers from relying:

> To any degree on the race or national or ethnic origin of motorists in selecting vehicles for traffic stops and in deciding upon the scope and sub-

> stance of post-stop actions, except where state troopers are on the look-out for a specific suspect who has been identified in part by his or her race or national or ethnic origin.[75]

In a telling moment, the head of the New Jersey state police was fired for remarks suggesting that minorities could be targeted because they were more likely to use drugs. This assertion is not factually correct:[76] Minorities are more likely to be arrested, but no more likely than whites to use drugs.[77]

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One study of police stops on a strip of interstate in Maryland provides some insight into the nature of this problem. Over several months in 1995, a survey found that 73 percent of the cars stopped and searched were driven by African-Americans, while they made up only 14 percent of the people driving along the interstate. Although the arrest rates were about the same for whites and persons of color (approximately 28 percent), the disproportionate number of stops of minorities resulted in a disproportionate number of persons of color being arrested.[78]

These concerns have taken on an added dimension since September 11, 2001, as many people of Arabic, Middle Eastern, or South Asian descent have been detained, arrested, or harassed by government authorities. In numerous instances, such individuals have been handcuffed, detained, or searched essentially because of their background, or as law enforcement officers explained in one of these confrontations, because the officers simply didn't like the way the person looked.[79]

It is an unfortunate, but real fact that California's decision to increase by ten-fold the number of DNA samples added each year to its DNA database will painstakingly reflect the unjust and unfounded racial biases existent in our society and well documented throughout our criminal justice system.

Increased Potential for Error

Despite what is often portrayed in both the media and the courtroom, DNA testing is not infallible.[80] Like all technological tools, the accuracy of DNA testing — whether performed on a sample obtained from a crime scene or one taken directly from an individual — is subject to human error. While it can be highly accurate when done right, the notion that DNA testing is error-free is wrong in both principle and practice. Proposition 69 will amplify this error potential and undermine quality assurance by overburdening California's DNA testing laboratories.

The fallibility of DNA testing was made painfully clear when, in January, 2003, the Houston Police Department's crime lab was shut down following an investigation that revealed widespread problems, including gross mishandling and misinterpretation of DNA evidence by laboratory personnel. More than 1300 cases involving DNA tests are currently under review, and so far, some 370 cases have been targeted for re-testing.[81] Discrepancies have been found in 25 percent of the 288 cases retested so far.[82] One person, Josiah Sutton, was released from prison in March 2003, after serving four years in jail for a crime he did not commit.[83]

Houston's lab is not the only one with problems. Labs in Fort Worth, Oklahoma City, Baltimore, Phoenix, W. Virginia, Montana, and Washington are also undergoing investigation and review of hundreds of cases.[84] Most recently, an employee of Orchid Cellmark, the world's largest private DNA testing firm, was accused of electronically manipulating DNA analyses in twenty tests.[85]

Any scientific procedure that involves human execution and judgment has some probability of error, and DNA testing is no exception to that rule. Errors in DNA testing can and have occurred during any of the three main stages of the DNA testing process: sample handling; analysis; and reporting of results.

Sample Handling Errors

Errors in the collection, handling and storage of DNA samples can result in incrimination of an innocent person. This type of error is known to have occurred in several cases. In 2002, it was discovered that 26-year-old Lazaro Soto Lusson was mistakenly charged with multiple felonies because the Las Vegas police crime lab switched the labels on two DNA samples. While in jail on an immigration hold, Lusson's cellmate, Joseph Coppola, accused him of rape. Police took DNA samples from both men to investigate the allegation. While undergoing the analysis, they ran the samples against the state database and matched Lusson's mislabeled DNA to two unsolved sexual assaults. Lusson faced life in jail and was incarcerated for over a year before this mistake was discovered.[86] Similar sample switch errors have led to false incrimination in rape cases in Philadelphia and San Diego.

DNA samples can also be contaminated, either before or after collection, especially if they are not

stored under proper conditions. Even trace amounts of outside DNA can complicate a DNA analysis.

Analysis Errors:
Errors associated with the DNA analysis itself are perhaps the least recognized. Many people assume that DNA testing is "objective," but significant ambiguity can arise in interpreting the computer-generated graph displays that are produced in DNA testing.[87] When DNA is typed, a computer-generated graph displays a series of peaks corresponding to alleles, or short, repeating segments of DNA. Everyone has these segments, but they vary in length. The computer labels the alleles based on their length. Ambiguity arises in interpreting these graphs, especially in cases where there is a mixture of two or more sources of DNA. In these cases, it can be difficult to determine which alleles go with which contributor. Presence of one source of DNA can also mask another, particularly where a mixed sample contains unequal amounts of DNA from each source. Degradation can also cause one or more sources to go undetected. Spurious peaks in the graphs, that might be due to air bubbles or other sources of "noise" can further complicate the picture, and can be confused with true peaks.[88]

Misinterpretation of DNA tests led to the false conviction of Timothy Durham in Tulsa, Oklahoma. Durham was convicted of raping an 11-year-old girl and sentenced to 3,000 years in prison, despite having produced eleven alibi witnesses who placed him in another state at the time of the crime. The prosecution's case rested almost entirely on a DNA test, which showed that Durham's genotype matched that of the semen donor. Post-conviction DNA testing showed that Durham should have been excluded as a possible suspect, and re-analysis of the initial test showed that the misinterpretation arose from the difficulty of separating mixed samples. The lab had failed to separate completely the male and female DNA from the semen stain, and the combination of alleles from the two sources produced a genotype that could have included Durham's. Durham was released in 1997 after serving four years in prison.[89]

Reporting Errors
Failure to report results of DNA tests in their entirety and the reporting of misleading or inaccurate statistical information has also resulted in conviction of innocent people. Reporting errors were responsible for placing Josiah Sutton behind bars for nearly five years for a rape he could not have committed. Sutton's conviction rested almost entirely on the basis of a DNA tests performed by the Houston Police Crime Laboratory. Re-analysis of the lab report showed that the lab technician had mistakenly reported that Sutton's DNA profile was included in the profile of a semen sample taken from the back of the car, where the rape was committed, when it was not. In addition, she presented the DNA data to the jury in a misleading way that overstated its value, and failed to provide statistical estimates that would have demonstrated that Sutton's DNA profile was but one of many that could have been included in the mixed evidentiary samples in the case, including a vaginal sample.[90]

While testing errors and systemic laboratory problems uncovered in crime labs in some states are thought to be the exception rather than the rule, these cases should remind us of the fallibility and limitations inherent in DNA testing and caution us against an over-reliance on DNA in the pursuit of justice.

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California has been fortunate so far in that its main DNA laboratory has not experienced the severe problems that have been uncovered in Houston and elsewhere. But the demands imposed by Proposition 69 will seriously overwhelm the system. The California Department of Justice claims it will move to "triple shifts" and possible outsourcing to private labs in order to offset the enormous backlog created under the law.[91] These steps are unlikely to meet the full demand to process samples at ten times the rate they are currently received, and will only jeopardize quality assurance.

Currently, while several laboratories around the state test DNA from crime scenes, all testing for the criminal database is performed by the California Department of Justice. This centralization of the database has provided for reasonable quality assurance and consistency in testing and storing DNA samples and profiles and has helped prevent errors, sample mix-ups, contamination, and other problems that we have discussed. The consequences of outsourcing could be profound. Error rates are likely to increase

and new sources of error may be introduced as samples are processed by and transferred to and from other facilities.

There is no doubt that California's DNA laboratory will be seriously overwhelmed by trying to meet the demands imposed by the new law. It will be both ironic and tragic if an initiative that claimed to protect the innocent instead leads to the creation of a whole new round of innocence cases.

Lack of Privacy Protections

While the new California law requires a dramatic expansion of the California database, it provides none of the needed individual privacy protections.

Drawing a DNA sample is not the same as taking a fingerprint. Fingerprints are two-dimensional representations of the physical attributes of our fingertips. They are useful only as a form of identification. DNA profiling may be used for identification purposes, but the DNA itself represents far more than a fingerprint. Indeed it trivializes DNA data banking to call it a genetic fingerprint and at least one court has specifically rejected that term.

The main privacy concerns stem not so much from the DNA test per se, but rather from the permanent retention of the biological sample. The amount of personal and private data contained in a DNA specimen makes its seizure extraordinary in both its nature and scope. The DNA samples, which are being held by state and local governments, can provide insights into the most personal family relationships and the most intimate workings of the human body, including the likelihood of the occurrence of over 4,000 types of genetic conditions. Almost every week, new discoveries are reported about the ability of a new genetic test to provide information about a person's ancestry, physical characteristics, predisposition to a disease, or behavioral traits.

The potential for misuse of this vast information is real. And because genetic information pertains not only to the individual whose DNA is sampled, but also to everyone who shares in that person's bloodline, potential threats to genetic privacy posed by their collection extend well beyond the millions of people whose samples are currently on file.

As previously mentioned, the United Kingdom has already started to mine its criminal database for information beyond identification – for example, to search for relatives of a potential suspect who would likely share some of their genetic makeup, or to search for a person with a particular rare gene found associated with crime scene evidence.

Furthermore, claims have been and will continue to be made that there are genetic markers for aggression, substance addiction, criminal tendencies and sexual orientation. And in that light, it is worth bearing in mind that there is a long unfortunate history of despicable behavior by governments toward people whose genetic composition has been considered "abnormal" under the then prevailing societal standards.

In recounting that history and documenting its privacy concerns, a National Research Council Report stated:

> These privacy concerns are far from abstract. The eugenics movement in this country, which resulted in thousands of involuntary sterilizations, the suggested screening of violent men for extra Y chromosomes, the sickle cell screening tests employed to prohibit marriages, and the current privacy concerns over HIV screening, underlie the Panel's following recommendation: Use of a data bank for [purposes] other than law enforcement suspect identification should be expressly prohibited and subject to criminal penalties.[92]

There are several privacy protections that might have been put in place in amending California's database law. The most important would have been to require destruction of the DNA samples and profiles in the event that there is no conviction. Instead, the law allows for including those profiles in the database for two years, and then only removing them upon written request and approval. Neither does Proposition 69 require destruction of the biological samples, once they have been profiled. Retention of the biological samples leaves open the possibility that the samples will be misused. All privacy concerns are also exacerbated under the new law because it specifically allows for offender profiling to be outsourced to private laboratories. Private laboratories looking out for their own profits are even more likely to misuse stored DNA samples, and will not be subject to the basic checks and balances required of a public institution.

Nothing for the Innocent

Despite the claim in its title, there is absolutely nothing in this new law that will specifically help to "protect the innocent." Proposition 69 does nothing to remove any of the procedural or financial obstacles that currently exist for those individuals in prison who have a claim of innocence and wish to seek access to DNA testing. Proponents of Proposition 69 were entirely misleading to call this initiative an "Innocence Protection Act" when it was never about innocence, and only about catching possible suspects.

Indeed, DNA testing can and should be used to exonerate innocent persons. But this use of the tech-

nology is not contingent on enlarging the DNA database, or even having a DNA database at all.

Cost to Californians

While the actual costs of this measure are difficult to estimate precisely, there is no doubt that they will be extraordinary.

The California Legislative Analyst's Office (LAO) has estimated that the measure "would result in unknown annual state costs of over $10 million initially, increasing to a couple tens of millions of dollars annually when fully implemented. These costs are primarily related to analyzing up to 400,000 additional DNA samples annually."[93] The LAO's office also based their estimate on a per sample estimate for DNA testing provided to them by the CA DOJ DNA Laboratory of $50 per sample for buccal swabs.[94]

We believe the actual costs of the law will be significantly larger than the LAO's rough, baseline figures. In short, the estimate of $50 per sample for DNA testing does not appear to include the full cost of testing. Lance Gima, the Bureau Chief of the California Department of Justice DNA Laboratory, himself admitted at a state senate committee hearing on the initiative that the $50 per sample estimate was likely low, and did not include facility and some personnel costs.[95] Indeed, a more realistic estimate of the true costs of testing can be obtained by dividing the lab's annual budget[96] by the number of samples processed in a year. By that analysis, it has actually been costing the lab on the order of $315 per sample.

The CA DOJ plans to switch from processing blood samples to buccal swab samples within the first year of the initiative. This could reduce the cost of testing by another $50 per sample.[97] In addition, the costs associated with testing may not increase linearly with the rise in demand for testing under the initiative; surely there are some fixed costs or others that will behave non-linearly. On the other hand, the new law will introduce new demands, such as a need for much more extensive intra- and inter-agency coordination, the hiring of many new staff and buying of new equipment, and possibly, a larger lab. Regardless, this estimate of $265 per sample for buccal swab testing is a more realistic high-end estimate of the actual costs of testing. By this estimate, the costs of testing the 600,000 people who will qualify for testing in the first year will be $159 million.

In sum, the actual costs of testing the people who qualify for testing in this next year will likely be somewhere between the LAO's estimate of "a couple of tens of millions of dollars" and this high-end estimate of $159 million.

This does not include the costs that will be born by the local laboratories, which are charged with testing DNA evidence from crime scenes and suspects. The costs of DNA testing for local labs tend to be much higher than for DOJ, because they do not have the same high-throughput equipment that has the capability of analyzing several samples at a time. Indeed, one analyst estimated costs at $800 per sample.[98]

Regardless of the precise costs, the law's plan to pay for itself by levying an additional 10 percent penalty on criminal fines will surely fall short of covering the true costs. We estimate that a 10 percent surcharge on criminal penalties will generate at best, $15.7 million per year.[99] But the 10 percent surcharge is not likely to be collected in full. First, California law specifies a priority distribution for the State penalty funds, and the DNA fund would fall into the lowest priority category. As such, where only partial payments are made, the DNA fund will not receive the full 10 percent of the payment. Partial and non-payments are the rule rather than the exception. Next, counties retain full discretion in setting the actual fine levied for criminal violations, and a judge may waive all or any part of the state penalty, in cases where payment would cause hardship to the person convicted or his/her family.[100] Finally, as fines increase, it cannot be assumed that collection rates will stay the same. It is reasonable to assume instead that collection rates will go down slightly due to a 10 percent increase.

Because the funding will not come close to covering the costs of the hundreds of thousands of additional DNA samples that will be required to be collected and analyzed under the initiative, the California Department of Justice will be mired in an ever-expanding backlog. Outsourcing this backlog to private labs will clearly not be possible. In addition to all of the other problems we've already discussed that are associated with outsourcing, this option simply will not be affordable unless further fines or taxes are levied.

A "Techno-fix" Solution to Criminal Investigation

California's new DNA database law will encourage an over-reliance on DNA technology and "cold hits" as a crime-solving method. While DNA technology can and has made an important contribution to solving crime, we must guard against the seduction of the technology. DNA testing is not foolproof, and thus should not be treated as a substitute for detailed investigative work. Nor will it ever be able to explain crime. Furthermore, as good as the technology gets, it will not help to solve the majority of cases where DNA is not left at the crime scene. DNA testing should remain only one tool of many that are used in crimi-

nal investigations, and the level of funding that is poured into this technology in relation to other crime-solving tools should reflect these inherent limitations.

DNA databases and testing are most helpful in solving sexual assault cases, where DNA is most likely to be present. But even in these cases, DNA does not always provide us the answers. For example, a large portion of sexual assault cases go unreported each year, because victims do not trust our criminal justice system and are afraid to come forward. Many other changes in law enforcement can and should be made both to prevent crime in the first place and to improve the accessibility and efficiency of law enforcement before spending limited resources on expanding the state's DNA database.

It should also be noted that more "cold hits" often reported by states after expanding their DNA databases does not necessarily mean more solved crime. Solving crime means having the time and resources to follow through on clues, whether they are "cold hits," eyewitnesses, or other information. In Virginia, prosecutors still had not acted upon 75 percent of the 1,000 hits that had been obtained in 2002 as late as October 2003.[101] Ironically, resources dedicated to expanding the database will only take away from those needed for investigational purposes to track down witnesses, victims, and suspects.

IV. CONCLUSION

Given all of the problems with Proposition 69, one might wonder why almost 7 million Californians cast their vote for it on November 2. The relative ease of its passage attests to the notion that criminal DNA databases are a prime example of a "slippery slope."

This slope is particularly slick and steep. In only a few years time, we have seen criminal DNA databases emerge as narrowly defined DNA collections from violent criminals to massive banks of all felons, juvenile offenders, and now, arrestees. The inclusion of arrestees is particularly significant because it crosses what might have served as a clear and minimal boundary to contain criminal databases to *actual criminals,* or at least those who have been convicted as such. Instead, California and the few other states that have crossed this line have thereby redefined the very nature and purpose of so-called "criminal" databases.

DNA testing is undoubtedly one of the most revolutionary tools available for aiding criminal investigations and exonerating the innocent. However, neither of these uses requires the creation, let alone the expansion, of permanent DNA collections. Any DNA collection poses extraordinary concerns about individual privacy, cost, potential for error, and racial bias. Each time we expand a criminal DNA database to include more categories of people and more DNA samples, these concerns increase in amplitude as well as in urgency, while returns to law enforcement diminish.

The recent history of unbridled DNA database development and expansion has occurred absent a much-needed national debate. Such a debate would address fundamental questions as to who should be included in this database and why, what protections should be afforded the stored data, and who should have access to it. It would also consider the value of such databases to society relative to other steps that might be taken to reduce crime, assist victims of crime, or otherwise improve the criminal justice system.

Continuing down a path of unaccountable "function creep" may bring us to a day when the entire U.S. population finds itself in a government database. Indeed, all-population databases have already been proposed in certain jurisdictions and academic circles, and current infrastructure is already in place that could readily adopt a compulsory DNA testing program. For example, most states already have in place programs that require DNA collection from newborns, and it is not inconceivable to imagine that DNA testing could become part of a procedure to apply for or renew a state driver's license.

If we are in fact headed for an all-population database – as it appears we are – it would be far better to have that discussion now, rather than cascading blindly into it. In the meantime, if our goal is to achieve greater justice, we should be far more cautious about the ways in which we collect and use DNA in the criminal justice system, so as to prevent needless invasions of individual privacy, errors that may otherwise have been avoided, or augmentation of already existing biases in the system. A cautious approach to DNA testing and databases would include the following baseline recommendations:

1) *There should be a procedure established for destroying the physical sample collected and used in DNA testing.* It is one thing for the government to permanently store a DNA profile; it is altogether different for the government to permanently retain a person's entire genetic code, which could be used for future genetic testing. Perhaps the most important step we could take against the future misuse of DNA data would be to destroy the biological samples taken from the millions of people who are represented in criminal DNA databases nationwide.
2) *Only persons convicted of serious, violent felonies should have their DNA entered into a* database. Permanent retention of any person's

DNA test results raises serious privacy and other concerns. In the very least, the government should not hold onto DNA profiles from persons who were never convicted of a crime or who were convicted of non-violent crimes.

3) *States should provide criminal defendants with access to DNA testing to establish their innocence.* While the government wants to use DNA testing as a sword to prosecute criminals, it must also make it a shield to protect the innocent. If we are serious about protecting the innocent as well as punishing the guilty, it is only fair that criminal defendants be given the opportunity to use DNA technology that was not previously available at the time of their trial.

California's decision to include innocent people in its criminal database is nothing short of tragic, and will undoubtedly mark a defining moment in the history of DNA database law. At the same time, it provides the impetus for a much-needed national debate that addresses fundamental questions as to who should be included in these databases and why. Unless and until we have that debate, we will continue to slide down a slippery slope of database expansion that might result in greater numbers of "cold hits" but will ultimately undermine our civil liberties and commitment to social justice.

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11. All figures are based on 2002 estimates taken from the Criminal Justice Statistics Center and the Data Analysis Unit of the California Department of Corrections, or the FBI Crime Index Statistics, unless otherwise noted. All statistics were rounded to the nearest 1,000.
12. See *Crime in California, 2002: Dispositions, available at* <http://caag.state.ca.us/cjsc/publications/candd/cd02/dispos.pdf> (last visited April 12, 2005), at 68.
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81. See R. Khanna, "Suspended Lab Workers Blame HPD for Problems," *Houston Chronicle,* September 24, 2003.
82. See R. Khanna and S. McVicker, "State Might Overhaul Crime Labs," *Houston Chronicle* (February 20, 2005), *available at* <http://www.chron.com/cs/CDA/ssistory.mpl/front/3047430> (last visited April 12, 2005).
83. See R. Khanna, "Lab Workers' Penalties Reduced," *Houston Chronicle,* September 25, 2003.
84. See T. Simoncelli, "Retreating Justice: Proposed Expansion of Federal DNA Database Threatens Civil Liberties," *GeneWatch* 17, no. 2 (2001): 3-6. *Available at* <http://www.gene-watch. org/genewatch.articles/17-2Simoncelli.html> (last visited April 12, 2005).
85. See L. Cadiz, "Md. Case Rattles Confidence in DNA Evidence," *Baltimore Sun,* November 19, 2004, at B1.
86. See G. Puit, "Man Files Lawsuit in False Imprisonment," *Las Vegas Review-Journal,* July 6, 2002, *available at* <http:// www.reviewjournal.com/lvrj_home/2002/jul-06-Sat-2002/ news/19129355.html>; G. Puit, "Wheels of Justice Turn Slowly," *Las Vegas Review-Journal,* July 30, 2002, *available at* <http:// www.reviewjournal.com/lvrj_home/2002/jul-06-Sat-2002/ news/19129354.html> (last visited April 12, 2005).
87. For a detailed discussion on computer-generated graphs in DNA typing, see W. C. Thompson, S. Ford, T. Doom, M. Raymer and D. E. Krane, "Evaluating Forensic DNA evidence: Essential Elements of a Competent Defense Review," *Champion* (April 2003), *available at* <http://bioforensics.com/articles/champion1/champion1.html> (last visited April 12, 2005).
88. *Id.*
89. See W. C. Thompson, F. Taroni and C.G.G. Aitken, "How the Probability of a False Positive Affects the Value of DNA Evidence," *Journal of Forensic Science* 48, no. 1 (2003), *available at* <www.astm.org> (last visited April 12, 2005).
90. See W. C. Thompson, "Review of DNA evidence in *State of Texas v. Josiah Sutton"* (District Court of Harris County, Cause No. 800450), February 6, 2003.
91. Personal Communication with Lance Gima, Bureau Chief, California Department of Justice Bureau of Forensic Sciences, March 2003.
92. See National Research Council Report, *DNA Technology in Forensic Science* (Washington, D.C.: National Academy Press, 1992), *available at* <http://www.nap.edu/books/0309045878/ html/index.html> (last visited April 12, 2005).
93. Letter to Attorney General Lockyer from Elizabeth Hill, LAO and Donna Arduin, Department of Finance, January 20, 2004.
94. $50 sample cost estimate provided by Lance Gima, Bureau Chief, California Department of Justice, personal communication, March 17, 2004.
95. Joint Hearing on Proposition 69 Before the California State Senate Public Safety and Assembly Public Safety Committees, September 23, 2004.
96. The California DNA Laboratory's operating budget for 2003-04 was $15.1 million. Electronic Communication with Les Kleinberg, California Department of Justice, June 3, 2004. This figure does not include an additional $1.2 million in grant funds.
97. According to Lance Gima, Bureau Chief, CA DOJ, the difference in the cost of testing blood and testing saliva samples is $50; the higher cost of blood testing is due to the cost of drawing blood.
98. See Letter from Carl Matthies California State Senator Kevin Murray, July 26, 2004.
99. The total amount of revenue generated by the state penalty assessment (which levies $10 for every $10 fine) for 2002-03 was $204 million. Existing law provides that of this revenue, 70 percent is transmitted to the state and 30 percent goes to the county. The state portion of the fund is then distributed among a series of specified funds. So even if the full 10 percent surcharge on criminal penalties were collected, this would generate only $15.7 million for the DNA initiative.
100. See Cal.Penal Code Section 1464(d).
101. See Letter from Carl Matthies, *supra* note 98.