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GINA'S GENOTYPES

David H. Kaye^{*†}

In August 2009, the Board of Trustees of the University of Akron added to the university's employment policy the following proviso: "any applicant may be asked to submit fingerprints or DNA sample for purpose of a federal criminal background check." Although the federal government does not do background checks with DNA, the policy is significant because it highlights a largely unexplored feature of the Genetic Information Nondiscrimination Act of 2008 ("GINA"). Hailed by the late Senator Edward Kennedy as "the first civil rights bill of the new century of life sciences," GINA generally prohibits employers from asking for "genetic information." The faculty senate and outside commentators have declared that the Akron policy is "of doubtful legality" because it "appears to violate" GINA. However, appearances can be deceptive. GINA's ban on the acquisition of "genetic information" also can be read so that it does not reach nonmedical DNA tests. Because employers have nondiscriminatory reasons to use forensic DNA identification technology, this narrower interpretation is more faithful to the express purpose of the law.

I. REASONS FOR EMPLOYERS TO COLLECT DNA IDENTIFICATION PROFILES

A spokeswoman for the University of Akron justified potential DNA sampling by suggesting that DNA would soon replace fingerprinting as the main technology used for criminal identification: "By including it in the policy we have the flexibility to match the technology if the Ohio State Highway Patrol makes changes to its system." But if this is what the trustees were thinking, they were misinformed. Law enforcement agencies are not soon likely to abandon fingerprinting as the routine form of personal identification. Advances in technology are improving automated comparisons of fingerprints, while DNA identification profiling does not distinguish between monozygotic twins (a situation that occurs in about 4 out of every 1000 births).

Despite the vacuity of the University of Akron's articulated basis for collecting DNA, some employers have legitimate reasons to acquire DNA information. A laboratory that performs forensic DNA typing, for instance, might wish to build a database of its employees' profiles so that the laboratory, the police, prosecutors, judges, and juries can be sure that the reported

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DNA profiles are free of contamination from the employees' DNA. An extreme example of such contamination comes from "the Phantom of Heilbronn." Police in Germany linked DNA evidence from 40 crimes—including the homicide of a policewoman in the southern German town of Heilbronn—to the same woman. Her DNA was found in samples from items ranging from a cookie to a heroin syringe to a stolen car. The police consulted diviners and fortune-tellers before they were able to match the mysterious DNA profile with a worker at a factory in Austria that produced cotton swabs used to collect DNA samples at crime scenes.

Employers other than forensic laboratories may have plausible reasons to acquire DNA identification profiles from selected employees. New York City already requires police officers who handle crime-scene materials to provide DNA samples. Beyond identification for elimination purposes in criminal investigations, a laboratory performing genetic tests for medical diagnosis that experiences a problem with contamination might use employee DNA profiles to determine which employee is the source of the extraneous DNA. Indeed, even employers who do not handle DNA samples could find forensic DNA analysis of employees useful in internal investigations of theft or sexual conduct on company property. Suppose that an employee complains that she believes that a coworker, who made unwelcome advances toward her, anonymously sent her parents a used condom with a vulgar note stating that the condom belonged to her boyfriend. The complaining employee gives the condom to the employer, who has it analyzed for DNA. If the profile does not correspond to the boyfriend's, the employer might well request that the alleged harasser submit a DNA sample or profile. Although this example may seem contrived, it parallels the facts in *In re McClain*.¹ In the case, the Indiana Supreme Court removed a judge from office because he "engaged in a pattern of harassment and abuse of office directed toward a female court employee and her family and boyfriend." In its investigation, the state judicial qualifications commission asked for a blood sample, and the supreme court emphasized that unwillingness to cooperate "may in itself constitute independent grounds for disciplinary charges." Thus, *McClain* reveals that employers can reasonably request or require employees to provide DNA samples or profiles for identification purposes.

II. GINA AS A BAR TO COLLECTING DNA IDENTIFICATION PROFILES

A. *The Purpose of the Law*

Although at first blush, the Akron policy appears to violate GINA's proscriptions, a closer analysis reveals that DNA testing strictly for identification does not conflict with the underlying goals of the statute. The legal pundits who have spoken out on the Akron policy have condemned it.

1. 662 N.E.2d 935 (Ind. 1996).

An attorney and consultant for Johns Hopkins University's Genetics and Public Policy Center opined that:

GINA clearly prohibits the collection of a DNA sample from employees or prospective employees by the University of Akron One of the primary targets for GINA was employers collecting genetic information from [employees] and using it to make decisions about hiring and firing and promotions. It's that kind of discrimination that GINA was designed to prohibit.

But is an employer's use of the DNA loci whose variations are recorded in criminal-offender databases—loci that have no significant medical applications²—really the “kind of discrimination that GINA was designed to prohibit”? The Act is concerned with medical information, not biometric information. Section 2 explains that Congress was worried about “[n]ew knowledge about the genetic basis of illness [allowing] for earlier detection of illnesses, often before symptoms have begun, [thus giving] rise to the potential misuse of genetic information to discriminate in health insurance and employment.” Congress listed examples of discrimination including: “sterilization laws by the States based on early genetic science,” actions taken against individuals with an allele for sickle cell anemia, and more recent cases in which employers allegedly performed genetic tests relating to specific medical conditions. Thus, GINA's stated objective is to establish “a national and uniform basic standard . . . to fully protect the public from discrimination and to allay concerns about the potential for discrimination, thereby allowing individuals to take advantage of genetic testing, technologies, research, and new therapies.”

B. *The Statute as Prophylaxis*

It is hard to imagine how the Akron policy would discourage individuals from seeking appropriate medical care or volunteering for genetic research. Still, potential employees might worry that if the university has samples of their DNA, it could use them—not for criminal background checks—but for rejecting their applications on the basis of genetic tests that indicate increased risk for certain diseases. Although the attempt to distinguish between using genetic and nongenetic medical information in employment decisions is fundamentally flawed,³ using a sample collected for identification purposes to limit employment opportunities because of medically relevant tests *is* the kind of “discrimination” that “GINA was designed to prohibit.”

Consequently, the question becomes whether Congress chose to ban, as a prophylactic measure, the collection of cells from job applicants because

2. David H. Kaye, *Please, Let's Bury the Junk: The CODIS Loci and the Revelation of Private Information*, 102 NW. U. L. REV. COLLOQUY 70 (2007); David H. Kaye, *Mopping Up After Coming Clean About “Junk DNA”*, Nov. 23, 2007, <http://ssrn.com/abstract=1032094>.

3. Mark A. Rothstein, *GINA, the ADA, and Genetic Discrimination in Employment*, 36 J. L., MED. & ETHICS, No. 4 (2008); Note, *Recent Legislation*, 122 HARV. L. REV. 1038 (2009).

of the risk that an employer might engage in such conduct. The president of the Council for Responsive Genetics has suggested that Congress did exactly this. He argues that because “GINA specifically prohibits employers from requesting or requiring genetic information” and “does not draw a distinction about how the DNA sample could be or should be used,” it follows that employers may not request DNA samples from present or prospective employees.

The premise of this argument is correct. GINA makes it generally illegal for “an employer to request, require, or purchase *genetic information* with respect to an individual” (emphasis added). Nonetheless, although some bioethicists maintain that a DNA molecule is itself genetic information,⁴ GINA does not explicitly prohibit the acquisition and storage of “information” in this extended sense. Instead, GINA defines “genetic information” as “information about [an] individual’s genetic tests.” It defines a “genetic test” as “an analysis of human DNA, RNA, chromosomes, proteins, or metabolites, that detects genotypes, mutations, or chromosomal changes.” Plainly, the tested sample—that is, the biological material taken from the employee—is neither a genetic test nor information about that test.

C. Defining Mutations and Genotypes in Science and Law

Because the DNA sample is not itself “genetic information,” we must ascertain whether asking for a DNA sample for identification purposes constitutes requesting “genetic information” within the meaning of the statute. I shall consider three modes of interpretation—literal, intentional, and purposive. A literalist could argue that the words “mutations” and “genotypes” clearly encompass identification testing. Biologically, all genetic variation in a population results from mutations. Furthermore, forensic scientists have been known to refer to the medically uninformative alleles used in DNA identification testing as “DNA genotypes.”⁵

Yet, “genotype” usually refers to a gene—a long (and possibly interrupted) sequence of DNA that guides the production of proteins in cells, thus generating observable effects or traits (“phenotypes”) in the organism. Because the DNA variations used for identification—particular short-tandem-repeat (“STR”) alleles—produce no differences in phenotypes, it is odd to characterize them as genotypes. The justification for doing so is that even nonsense DNA sequences are inherited in the same manner as the classical genes that influence physical traits. That the STRs are subject to Mendel’s laws, however, does not mean that they are genotypes. The sequences used for identification do not work like genes, which influence phenotypes. Thus, the literalist analysis is inconclusive.

4. SCOTT BURRIS & LAWRENCE O. GOSTIN, GENETIC SCREENING FROM A PUBLIC HEALTH PERSPECTIVE 137, 139 (Mark A. Rothstein ed. 1999); P. Reilly, *Rethinking Risks to Human Subjects in Genetic Research*, 63 AM. J. HUMAN GENETICS 682 (1998).

5. DAVID H. KAYE, THE DOUBLE HELIX AND THE LAW OF EVIDENCE 37, 41-42 (2010).

A deeper problem with blindly importing a scientific definition is that it divorces text from context, producing an interpretation of “genetic information” that is not faithful to the purpose of the law or the intent of its drafters. As noted earlier, GINA is concerned with what are popularly known as disease mutations—changes in functional DNA sequences that affect an individual’s disease status—or markers for those mutations. Why, then, should GINA be construed to reach tests for DNA variations that are not themselves genes? The answer does not lie in genetics textbooks or dictionaries of biology. A scientific term in a statute need not function the same way it does in biology. In *Nix v. Hedden*,⁶ for instance, the Supreme Court had no difficulty classifying a tomato as a vegetable under the Tariff Act of March 3, 1883, although botanists regard a tomato as a fruit.

Generally, to give content to technical or scientific terms that might have been used imprecisely in legislation, courts look to the evils that the statute is designed to mitigate.⁷ A purposive analysis emphasizes that GINA is a “civil rights law” intended to eliminate “discrimination” against asymptomatic individuals. Because the STR profiles used in identification are not variations in genes and carry no medical information that would be valuable for prediction or diagnosis, it is not immediately clear that Congress used the words “genetic information,” “genotype,” or even “mutations,” to prohibit employers from requiring employees to provide an identifying STR profile.

D. And Yet . . .

Despite this conclusion, the theory that STR profiles are not genetic information (as opposed to genomic information) is subject to a major objection. Section 202(b)(6) explicitly allows an employer to acquire genetic information “where the employer conducts DNA analysis for law enforcement purposes as a forensic laboratory or for purposes of human remains identification, and requests or requires genetic information of such employer’s employees, but only to the extent that such genetic information is used for analysis of DNA identification markers for quality control to detect sample contamination.” Why would Congress include this exception if “genetic information” is confined to information about genes? If Congress found it expedient to have an exception for some loci that are not genes, then it must have intended the word “genetic” to reach all manner of “mutations.”

Although initially appealing, this intent-based analysis is not ultimately persuasive. Several explanations for the law-enforcement and human-remains exceptions are available. First, Congress might have understood “genetic information” to be limited to the activity of genes, but adopted the

6. 149 U.S. 304 (1893).

7. *E.g.*, *United States v. Brisbane*, 367 F.3d 910 (D.C. Cir. 2004) (rejecting a chemical definition of “cocaine base” for criminal sentencing purposes in light of Congressional concern with other properties of crack cocaine).

exception as a response to the possibility, stressed by some legal commentators, that the loci used for identification have (or will turn out to have) medical diagnostic or predictive value.⁸ Legislators sharing this belief may have wanted to include the exception to forestall the need to amend the law in the future. Second, the sponsors of the bill may have believed that the exception was not strictly necessary in light of their understanding of “genetic information” but still included it to circumvent any opposition from the law-enforcement and military lobbies. Finally, and most likely, individual legislators may not have had any view about the distinction between genomic and genetic information, but perceived no reason not to include the quality-control exception of section 202(b)(6) for laboratories conducting law enforcement and human remains testing.

It is risky to try and guess what was in the minds of individual legislators, let alone discern Congressional intent regarding a matter that received very little attention and no debate. Rather than seek the mythical, subjective intent of individuals who never considered the issue, it seems better to adopt the purposive mode of interpretation. The point of the law is what matters. The phrase “genetic information” should be read so as to achieve the best fit between the statute and its goals. As stated countless times in committee, in floor debate, in public announcements, and most importantly, in the Act itself, GINA’s goal is not to regulate the flow of information about loci that are irrelevant to any action based on medically significant loci. The statutory goal is to keep insurers and employers from making adverse decisions based on information, gleaned from testing genes or markers for genes, about the future health of a currently asymptomatic individual. To prevent such “discrimination” (and only such discrimination), GINA also blocks the acquisition of this “genetic information.” Fidelity to this statutory purpose suggests that neither this ancillary ban on acquisition of information nor the primary ban on use extends to nonmedical information, even if it happens to come from a limited inspection of the genome. DNA features that serve only as personal identifiers are not “genetic information” within the meaning of the statute.

III. TOWARD A BROADER EXCEPTION

Despite the cramped phrasing of section 202(b)(6), the provision actually conforms to the manifest purpose of the statutory system. When GINA’s drafters actually confronted an instance of nonmedical information, they explicitly allowed employers to acquire the information. A purposive construction of GINA’s words suggests that the outcome should be the same in other situations that involve only nonmedical information. Of course, textualists might reject this conclusion. If one were to treat the absence of explicit exceptions for similar uses of data on DNA features that are

8. E.g., Simon A. Cole, *Is the ‘Junk’ Designation Bunk?*, 102 NW. U. L. REV. COLLOQUY 54, 54 (2007), Elizabeth E. Joh, *Reclaiming “Abandoned” DNA: The Fourth Amendment and Genetic Privacy*, 100 NW. U. L. REV. 857 (2006).

unrelated to the statute's goals as if it were a legislative rejection of such exceptions, then it would be necessary to ask whether Congress should return to the drafting board.

Whether and how to protect job applicants or employees who do not wish to supply a DNA identification profile are significant questions. In my view, when the procedures for collecting and analyzing DNA ensure that no medically related information that could affect employment status, conditions, or benefits will come into existence, then a "nondiscrimination" law such as GINA should not tie an employer's hands. Thus, a forensic laboratory—or other kind of laboratory—*should* be permitted to require its workers to provide their STR profiles for the purpose of laying to rest any suggestion that they have contaminated a sample with their own DNA. GINA explicitly recognizes this for some laboratories that do criminal case work or identify human remains, but the section 202(b)(6) exception for "quality control" applies only to employers who themselves "conduct[] DNA analysis for law enforcement purposes as a forensic laboratory or for purposes of human remains identification." The police agency whose officers or evidence technicians collect DNA traces at crime scenes do not fall within this exemption. Neither do firms that produce the materials used by these agencies or by laboratories that analyze crime stains. The many laboratories providing DNA tests in cases of disputed parentage and other civil matters also will find the exception of no avail. Still other laboratories performing medical DNA tests that could be compromised by contamination will be unable to determine the specific source of the contamination using DNA identification methods. And, of course, the exception is useless for internal investigations of serious misconduct in cases like *McClain*.

If the purposive reading of GINA were found wanting, one solution would be for Congress to craft a broader, explicit exception that lists all the situations in which an employer's acquisition of genetic information does not threaten to produce "genetic discrimination" involving medical conditions in insurance and employment. But fully enumerating all the relevant exceptions could prove difficult. As experience with rape-shield laws demonstrate, the everything-is-forbidden-except-that-which-is-explicitly-allowed approach tends to be overly restrictive.⁹ A more flexible solution would be to eliminate the cramped law-enforcement exception and to define "genetic information" (or replace it with a more transparent phrase) so that DNA identification profiles are not treated as if they were the disease-related "genotypes" or "mutations" that are GINA's true target. GINA is not a general genetic-privacy law. It is a nondiscrimination law. Judicially or legislatively, the definitions should be aligned so that "the first civil rights bill of the new century of life sciences" stays on target.

9. See, e.g., Harriett R. Galvin, *Shielding Rape Victims in the State and Federal Courts: A Proposal for the Second Decade*, 70 MINN. L. REV. 763 (1986).