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THE WILD WEST OF INVESTIGATORY GENETIC GENEALOGY: THE IMPACT OF THE USE OF INVESTIGATORY GENETIC GENEALOGY IN THE IDAHO MURDERS ON THE FUTURE OF CRIMINAL INVESTIGATIONS AND THE NEED FOR REGULATION

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Investigative genetic genealogy is the emerging practice of combining DNA analysis with traditional genealogy research by utilizing DNA from direct-to-consumer companies, like GEDmatch, to identify suspects or victims of crime. Recently, this criminal investigatory technique was likely used in an active high-profile investigation to make an arrest. The national attention attainted by the investigation combined with the widespread coverage of its use of genetic genealogy will increase law enforcement's interest in using genetic databases in active investigations. Despite the investigatory tool raising privacy and Fourth Amendment concerns, genetic genealogy remains largely unregulated. Accordingly, state legislative branches and the federal executive branch must enact enforceable regulation to protect against unconstitutional searches and restrict law enforcement's ability to access genetic information.

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I. INTRODUCTION

In a case that seemed to have no suspects, no weapons, and no motive, many people thought the Idaho Murderer was going to be society's modern-day Zodiac Killer.[1] However, thanks to

[1] Law enforcement arrested and charged Bryan Kohberger with four counts of first-degree murder and one count of felony burglary in connection with the Idaho Murders. As of March 2023, Kohberger's case is unresolved, and he is presumed innocent until proven otherwise. *See* Lilia Luciano, *What to Expect at Idaho Murders Suspect Bryan Kohberger's Next Court Hearing*, CBS MORNING (Jan.

deoxyribonucleic acid ("DNA") and technological advancements, society will not have to go decades without an arrest. In December 2022, law enforcement officers arrested Bryan Kohberger for the Idaho Murders.[2] Law enforcement likely pointed their investigation at Kohberger after using investigatory genetic genealogy ("IGG") to trace DNA left at the crime scene back to Kohberger.[3]

IGG is the emerging practice of utilizing genetic information from direct-to-consumer companies, like 23andMe, Ancestry, and GEDmatch, to identify suspects or victims in criminal cases.[4] IGG has almost exclusively been used in cold cases largely due to the time and costs associated with the process.[5] However, its potential use in the Idaho Murders makes it one of the most high-profile cases in which law enforcement used IGG to name a suspect so soon after the crime.[6] The publicity of the Idaho Murders and the probability of the use of IGG will likely cause an increase in demand in a field that was already booming. Despite the potential impact of IGG on the future of criminal investigations, it remains largely unregulated,

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13, 2023), https://www.cbsnews.com/news/idaho-murders-update-suspect-next-court-hearing-june-26-bryan-kohberger/ [https://perma.cc/TYS8-C3PR].

[2] Kerry Breen, *What We Know About the Man Charged in the Idaho Quadruple Murders*, CBS NEWS (Jan. 12, 2023, 7:28 PM), https://www.cbsnews.com/news/bryan-kohberger-charged-suspect-idaho-murders/ [https://perma.cc/S3EH-7MZA].

[3] *See* Elizabeth Wolfe et al., *Authorities Tracked the Idaho Students Killings Suspect Cross-Country to Pennsylvania, Sources Say*, CNN (Dec. 31, 2022), https://www.cnn.com/2022/12/31/us/bryan-kohberger-university-of-idaho-killings-suspect-saturday/index.html [https://perma.cc/KS8F-9NRW].

[4] Tomoko Y. Steen et al., *Genetic Genealogy: DNA and Family History*, LIBRARY OF CONGRESS: RSCH. GUIDES, https://guides.loc.gov/genetic-genealogy [https://perma.cc/Q37L-UED4] (last updated Sept. 11, 2021).

[5] *See* Lindsey Van Ness, *DNA Databases are Boon to Police but Menace to Privacy, Critics Say*, PEW, https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2020/02/20/dna-databases-are-boon-to-police-but-menace-to-privacy-critics-say [https://perma.cc/949C-7CZU] (last updated Feb. 20, 2020).

[6] Heather Tal Murphy, *How Police Actually Cracked the Idaho Killings Case*, SLATE (Jan. 10, 2023), https://slate.com/technology/2023/01/bryan-kohberger-university-idaho-murders-forensic-genealogy.html [https://perma.cc/Y2YV-J49D].

with only three states having any type of regulation regarding law enforcement's use of this investigative tool.

This Article proceeds in seven parts. Part II provides background information about the Idaho Murders and the technique behind IGG. Part III presents the Fourth Amendment doctrine applicable to the use of IGG in criminal investigations. Part IV analyzes whether IGG constitutes a Fourth Amendment search. Part V discusses current state and agency IGG regulation. Part VI presents commercial DNA companies' internal policies in regard to IGG. Finally, Part VII argues that both federal executive and state legislative policy is best suited for IGG because it allows for enforceable legal regulations and remedies and avoids piecemeal judicial regulation.

II. BACKGROUND

A. Idaho Murders

In the early morning of November 13, 2022, four students from the University of Idaho were mysteriously stabbed to death in their off-campus home.[7] The case, commonly referred to as the Idaho Murders, involved three female victims, who all lived in the rental home, and one male victim, the boyfriend of one of the female victims.[8] Two additional roommates were in the home the night of the murders, but they were not attacked.[9] This case gained attraction and quickly became a household mystery across the country. The public was captivated by trying to solve the mysterious murders. However, on December 30, 2022, just six weeks after the tragedy, the police shocked the public by arresting Bryan Kohberger, whose name seemingly came out of nowhere, for the murders.[10]

B. Use of IGG in the Idaho Murders

DNA certainly played a significant role in Kohberger's arrest, but the extent of that role is largely unknown to the public as of

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[7] Solcyre Burga, *Everything We Know About the Idaho Murders so Far*, TIME (Jan. 8, 2023), https://time.com/6245481/idaho-murders-what-to-know/ [https://perma.cc/DXT5-7Z2Z].

[8] *Id.*

[9] *Id.*

[10] *Id.*

February 2023. Police have closely guarded their investigative information to protect the investigation's integrity and Kohberger's right to a fair trial, which has yet to occur.[11] However, the probable cause affidavit used when applying for Kohberger's arrest warrant confirmed some information about law enforcement's use of DNA. According to the affidavit, a "tan leather knife sheath" was left lying on the bed next to one of the victims at the crime scene.[12] The sheath was processed, and the Idaho State Lab located a single source of male DNA ("Suspect Profile") left on the button of the sheath.[13] On December 27, 2022, Pennsylvania agents recovered trash from Kohberger's parents' home.[14] The trash was sent to the Idaho State Lab to compare it to the DNA left on the sheath.[15] The lab reported that the DNA profile obtained from the trash came from a male who could not be excluded as the Suspect Profile's biological father.[16] Further, at least 99.9998% of the male population would be expected to be excluded from the possibility of being the suspect's biological father.[17]

Reports about the investigation's use of IGG to name Kohberger as the lead suspect spread as early as the day after Kohberger's arrest.[18] News outlets across the country reported that the single strand of DNA found on the sheath was uploaded into a public database, and Kohberger was eventually named as a result.[19] Several

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[11] Luciano, *supra* note 1. As of March 10, 2023, Kohberger's next court hearing is set for June 26, 2023. *Id.* At the hearing, the State will present some of its evidence against Kohberger to show there is probable cause for his case. *Id.* The preliminary hearing will be the first step in what could be a very long judicial process. *Id.*

[12] Affidavit for Probable Cause at 2, State v. Kohberger, CR29-22-2805, Moscow Police Dep't Idaho (Dec. 29, 2022), https://www.documentcloud.org/documents/23564645/kohberger-moscow-pd-probable-cause-affidavit.pdf [https://perma.cc/RV39-4TEY].

[13] *Id.*

[14] *Id.* at 18.

[15] *Id.*

[16] *Id.*

[17] *Id.*

[18] *See* Wolfe et al., *supra* note 3.

[19] *See id.*; Aaron Katersky et al., *Idaho Murders: Suspect was Identified Through DNA Using Genealogy Databases, Police say*, ABC NEWS (Jan. 2,

news outlets cited their source as being "close to the Idaho student murders investigation" or "law enforcement sources."[20] This information about the use of IGG in the investigation may be valid, but neither court documents nor a named source have verified its use.

Despite the lack of information in the probable cause affidavit about law enforcement's use of IGG, its use cannot be ruled out. According to CeCe Moore, the Chief Genetic Genealogist for Parabon Nanolabs,[21] IGG is "simply a tip. It is a lead generator. It should never be used as evidence against a suspect, and so it is proper that it would have been left out of the affidavit."[22] The use of IGG could have been how law enforcement initially identified Kohberger as a suspect and then looked more closely at their other evidence to see if it all aligned with him.[23] Alternatively, police could have been in the process of using IGG to build Kohberger's family tree for confirmation of their investigation.[24] Either way,

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2023), https://abcnews.go.com/US/idaho-murders-suspect-identified-dna-genealogy-databases-police/story?id=96088596 [https://perma.cc/7TGU-FX8G].

[20] Terri Parker, *Genealogists Able to Identify Bryan Kohberger as Idaho Murder Suspect Within Days: Groundbreaking Case of Real-Time DNA Detecting*, WPBF NEWS (Jan. 3, 2023), https://www.wpbf.com/article/bryan-kohberger-idaho-murder-genetic-genealogy/42389434 [https://perma.cc/P5N5-2WVF]. *See also* Wolfe et al., *supra* note 3; Katersky et al., *supra* note 19.

[21] CeCe Moore is a leader in the field of genetic genealogy and is frequently consulted by DNA testing companies, genealogists, adoptees, law enforcement and the press. Kim Elsesser at al., *50 Over 50: Lifestyle: CeCe Moore*, FORBES, https://www.forbes.com/profile/cece-moore/?sh=7b98c00b1a96 [https://perma.cc/93DU-LCN6] (last visited Feb. 24, 2023). Moore is the head of the Genetic Genealogy Services for Law Enforcement Unit at Parabon Nanolabs. *Id.* The unit has a record of over 200 successful identifications of violent criminals, many of them cold cases, since 2018. *Id.* Moore's work has led to the first conviction, the first conviction through jury verdict, and the first exoneration in criminal cases where the suspect was identified through investigative genetic genealogy. *Id.*; *see also* CeCe Moore, *CeCe Moore Genetic Genealogist*, CECE MOORE, https://www.cecemoore.com/ [https://perma.cc/3V35-YM83] (last visited Jan. 30, 2023).

[22] Michael Smerconish, *DNA Is Star Witness in Idaho Killings* (video), CNN (Jan. 7, 2023), https://www.cnn.com/videos/us/2023/01/07/smr-idaho-dna.cnn [https://perma.cc/XE3T-MRVT].

[23] *Id.*

[24] *Id.*

Moore believes the "leak" of information about the investigation's use of IGG is evidence of law enforcement at least attempting to use IGG.[25] Therefore, the use of IGG in the Kohberger investigation cannot be ruled out simply because it has not yet been confirmed.

C. Traditional DNA Searches vs. IGG

The traditional approach to DNA searches in criminal investigations involve law enforcement using the Federal DNA database known as Combined DNA Index System ("CODIS").[26] Within CODIS is the National DNA Index System ("NDIS") which consists of DNA profiles contributed by federal, state, and local participating forensic labs.[27] When law enforcement collect a DNA sample from a crime scene, the sample is first uploaded into the CODIS system and compared to DNA samples collected from other crime scenes, convicted persons, and previous arrestees.[28] The DNA profiles consist of twenty short tandem repeats ("STRs") generated by accredited forensic labs that must comply with quality assurance standards and requirements.[29] STRs contain repeating sequences of DNA, and the "number of repeat units is highly variable among individuals."[30] To identify an offender, the lab must match the allele profile of thirteen core STRs from the DNA sample obtained from the crime scene to one of the samples in CODIS.[31]

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[25] *Id.*

[26] *Frequently Asked Questions on CODIS and NDIS*, FED. BUREAU OF INVESTIGATION, https://www.fbi.gov/services/laboratory/biometric-analysis/codis/codis-and-ndis-fact-sheet [https://perma.cc/T56J-Q8D9] (last visited Mar. 8, 2023) [hereinafter *FBI Fact Sheet on CODIS and NDIS*].

[27] *Id.*

[28] *Id.*

[29] Christi J Guerrini et al., *Four Misconceptions About Investigative Genetic Genealogy*, 8 J.L. & BIOSCIENCE 1, 4 (2021).

[30] STRs were chosen to be used for forensic applications because they were not known to be associated with any physical traits or medical characteristics. Nicole Wyner at al., *Forensic Autosomal Short Tandem Repeats and Their Potential Association with Phenotype*, 11 FRONTIERS GENETICS 1, 2 (2020). STRs are located within the non-coding regions of the genome, and it was previously thought that non-coding regions of the genome play no functional role. *Id.* However, this notion has been contested in recent years and there is increasing evidence there may be associations between STRs and medical conditions. *Id.*

[31] *FBI Fact Sheet on CODIS and NDIS*, *supra* note 26.

If a search does not result in a CODIS match, investigators can turn to IGG to try to identify the criminal offender. IGG combines DNA analysis with traditional genealogy research.[32] Law enforcement upload the DNA profile collected at the crime scene to at least one of the genetic genealogy databases, like GEDmatch or FamilyTreeDNA.[33] The intention of doing so is that the database will produce a match or a list of partial matches from the genetic relatives of the unidentified DNA profile. Genetic genealogists or a forensic consulting firm, like Parabon NanoLabs, then can use obituaries, birth certificates, public documents, and social media to try to build out a family tree and identify possible suspects.[34]

In addition to historical documents, genealogists also use single nucleotide polymorphism ("SNP") profiles to build a family tree.[35] When direct-to-consumer company users take a DNA test and send it to be studied, the company labs receive 600,000–700,000 SNPs from its users.[36] Genealogists use SNPs rather than STRs because SNPs are more evenly and densely distributed throughout a person's genome.[37] Additionally, SNPs can be passed down through generations, and the number of SNP matches signifies how closely the samples are related.[38] Thus, SNPs can be used to identify more distant genetic relatives than STRs.[39]

IGG is an expansion over standard CODIS searching in both the amount of information that can be obtained from the search and the size of the population being searched. While both CODIS and IGG use DNA to try to identify a suspect, a CODIS search will only

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[32] Cody Sorrell et al., *An Introduction to Forensic Genetic Genealogy Technology for Forensic Science Service Providers*, FORENSIC TECH. CTR. OF EXCELLENCE—U.S. DEP'T OF JUST. 1, 1 (2022), https://forensiccoe.org/private/6320f16805925 [https://perma.cc/ZJ7W-BQ8J].

[33] Guerrini et al., *supra* note 29, at 2.

[34] Eric Levenson & Artemis Moshtaghian, *This Cold Case is the First Genetic Genealogy Arrest to Go to Trial*, CNN (June 12, 2019, 2:52 PM), https://www.cnn.com/2019/06/12/us/cold-case-genetic-genealogy-washington/index.html [https://perma.cc/LH94-K8GZ].

[35] Sorrell et al., *supra* note 32, at 2.

[36] Guerrini et al., *supra* note 29, at 4.

[37] *Id.*

[38] Sorrell et al., *supra* note 32, at 2.

[39] *Id.*

reveal a match if the offender has previously been arrested, convicted, or left DNA at a previous crime scene. However, IGG opens the door for a match to be made if anyone in the offender's genetic line took a commercial DNA test. This is significant because it drastically increases the number of people that could be identified from a DNA search.

A 2018 study projected that "around 60 percent of Americans of European descent could be matched to a third cousin or closer relation," despite not taking a DNA test themselves.[40] Further, "the technique could implicate nearly any U.S. individual of European descent in the near future."[41] This is a result of ancestry DNA companies' clientele being mostly white Americans of European descent.[42] Further, if an offender is not white, IGG may be less useful of a tool for law enforcement to use to identify the offender.[43]

There is a high chance that a white offender of European descent's relative has taken a direct-to-consumer DNA test because "on average, a person has around 850 relatives who are third cousins or closer relations."[44] Given the size of the potential search pool, it currently takes a significant amount of time to identify individuals based on their genetic matches because it requires extensive genealogical work, which becomes more difficult as the degree of relatedness between samples becomes larger.[45] However, if investigators have more information about the offender, it can significantly decrease the size of their search. For example, if investigators know the offender's age, sex, and/or geographic region

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[40] Brian Resnick, *How your Third Cousin's Ancestry DNA Test Could Jeopardize your Privacy*, VOX, https://www.vox.com/science-and-health/2018/10/12/17957268/science-ancestry-dna-privacy [https://perma.cc/FW9Z-LZ5C] (last updated Oct. 15, 2018).

[41] Yaniv Erlich et al., *Identity Inference of Genomic Data Using Long-Range Familial Searches*, 362 SCI. 690, 690 (2018).

[42] Resnick, *supra* note 40.

[43] *Id.*

[44] *Id.*

[45] *See id.*

where the offender may live, the search could go from 850 DNA samples to approximately 16 or 17 samples.[46]

D. Impact of the Use of IGG in the Idaho Murders

The Idaho Murders will have a lasting impact on future criminal investigations. If the Kohberger investigation used IGG, it means that IGG technology and methods have advanced to the point where it does not take too much time to build a family tree and identify an offender. If time is no longer a significant restraint, investigators can readily use IGG in active investigations. This makes the tool much more powerful, as it is extremely difficult, if not impossible, to commit a violent crime without leaving behind some type of DNA.[47] If police can quickly build a family tree, then any offender who commits a violent crime and leaves behind their DNA, like the Idaho Murderer, could be identified using IGG.

On the other hand, if the investigation did not use IGG, the idea that investigators did use it has already been spread by media outlets.[48] The widespread reporting puts the topic up for discussion and deeper evaluation as a method for solving active investigations. Additionally, other forensic labs are likely working on their current technology to speed up the process to be able to solve active investigations quicker and compete in the IGG field.

Either way, the attention the Kohberger investigation brought to IGG will likely have a lasting impact on criminal investigations, and

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[46] *See id.* In an interview following the publication of "Identity Inference of Genomic Data Using Long-Range Familial Searches," Yaniv Erlich, the lead author of the study as well as the chief science officer at MyHeritage, stated that knowledge of the offender's age can "reduce [the] search space by 90 percent." *Id.* Additionally, knowledge of the offender's sex can further decrease the search by half. *Id.* If investigators reduce the search to DNA samples of people who live in a 100-mile-wide area, another 50 percent of the DNA samples will be excluded. *Id.* "Altogether, we go from 850 individuals on average to something on the order of 16, 17 individuals," Erlich stated. *Id.* "At that point, you can use more elaborate tactics to really get to the person." *Id.*

[47] *See* Smerconish, *supra* note 22.

[48] *See* Wolfe et al., *supra* note 3 ("Genetic genealogy techniques were used to connect Kohberger to unidentified DNA evidence."); *see also* Katersky et al., *supra* note 19 (stating that police identified Kohberger as a suspect using DNA and public genealogy databases).

more resources will likely be devoted to cutting the time and costs associated with the use of IGG technology and methods. As the field of IGG advances, the likelihood that it will become a part of standard investigatory practice will increase. Before it becomes a routine practice, it should first be determined whether IGG is constitutional.

III. FOURTH AMENDMENT DOCTRINE

The Fourth Amendment guards the "right of the people to be secure in their persons . . . against unreasonable searches" and provides that "no Warrants shall issue, but upon probable cause."[49] This protection is designed "to prevent arbitrary and oppressive interference by enforcement officials with the privacy and personal security of individuals."[50] Once a court concludes that a government action is a "search," it must then determine whether protections of the Fourth Amendment are triggered.

A. DNA and the Fourth Amendment

Maryland v. King[51] is the only time the Supreme Court has addressed DNA in terms of the Fourth Amendment. The Court considered whether the Fourth Amendment prohibits DNA collection and analysis from arrestees yet to be convicted of felony charges.[52] The Court held that collecting DNA without a warrant from people who have been arrested for serious crimes, but have not yet been convicted, is not a violation of the Fourth Amendment.[53]

In *King*, the police arrested Alonzo King for an assault in 2009.[54] During booking, the police followed standard procedure by collecting a swab of King's saliva and entering his sample into CODIS.[55] Officers found that King's DNA matched the DNA of the perpetrator of an unsolved 2003 rape case.[56] King was consequently

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[49] U.S. CONST. amend. IV.
[50] Immigr. & Naturalization Serv. v. Delgado, 466 U.S. 210, 215 (1984).
[51] Maryland v. King, 569 U.S. 435 (2013).
[52] *Id.* at 442.
[53] *Id.* at 445.
[54] *Id.* at 435.
[55] *Id.* at 441.
[56] *Id.* at 435.

charged and convicted of the 2003 rape.[57] The Court determined that when probable cause supports an arrest for a serious offense, a cheek swab is a legitimate booking procedure when used for *identification* purposes under the Fourth Amendment.[58]

In reaching its decision, the Court engaged in a reasonableness balancing test to weigh the significant governmental interests against individuals' privacy interests when obtaining DNA samples of arrestees.[59] The legitimate government interests included accurate identification, law enforcement safety, more informed pre-trial custody determinations, and exoneration of those wrongfully convicted of an arrestee's prior crime.[60] In contrast, when it evaluated the privacy interests at stake for the accused, the Court focused on the intrusion of taking the sample.[61] The cheek swab required minimal intrusion to the arrestee because the process was quick and painless.[62] Additionally, arrestees have a diminished expectation of privacy once in police custody.[63] The privacy value of the collected DNA was low because police only obtained the part of DNA that identifies a person, not the part that shows genetic predispositions.[64] However, this distinction has been met with criticism regarding whether there is a "non-private" part of DNA. The Court determined that the legitimate government interests, combined with the incredible accuracy of DNA sampling, outweigh any additional intrusions that taking a DNA sample place upon arrestees.[65] As a result, DNA sampling from a suspect's cheek with a cotton swab during booking is reasonable under the Fourth Amendment.[66]

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[57] Maryland v. King, 569 U.S. 435 (2013).
[58] *Id.* at 465–66.
[59] *Id.* at 463.
[60] *Id.* at 454–56.
[61] *See id.* at 465.
[62] *Id.* at 463–64.
[63] Maryland v. King, 569 U.S. 435, 463 (2013).
[64] *See id.* at 464–65 ("If in the future police analyze samples to determine, for instance, an arrestee's predisposition for a particular disease or other hereditary factors not relevant to identity, that case would present additional privacy concerns not present here.").
[65] *Id.* at 461.
[66] *Id.* at 465–66.

In his dissent, Justice Scalia, joined by three other justices, emphasized that the heart of the Fourth Amendment "forbids searching a person for evidence of a crime when there is no basis for believing the person is guilty of the crime or is in possession of incriminating evidence."[67] This principle is "categorical and without exception[.]"[68] In order to conduct a "suspicionless search," the justifying motive must be something other than the investigation of a crime. [69] In Justice Scalia's view, there was no such non-investigative motive in *King*.[70] Thus, the majority's decision could open the floodgates for DNA identification and, without a limiting principle, could result in the use of DNA analysis in identifying individuals for minor offenses.

B. Katz Test

In 1967, the Supreme Court was called upon to create a new understanding of a search that could keep up with technological advancements. Before *Katz v. United States*,[71] courts evaluated Fourth Amendment violations purely through a property lens.[72] This understanding of the Fourth Amendment required the government to physically occupy a constitutionally protected space for a search to occur.[73] However, this understanding became less applicable and more archaic as technology advanced. The trespass test was largely abandoned once the Court decided that a privacy review was more appropriate to keep up with ever-changing technological advancements.[74]

In *Katz*, the Court chose to "protect[] people, not places," and in doing so, moved away from its previous property-based understanding of the Fourth Amendment to a privacy-based

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[67] *Id.* at 466 (Scalia, J., dissenting).
[68] *Id.*
[69] Maryland v. King, 569 U.S. 435, 466 (2013) (Scalia, J., dissenting).
[70] *Id.*
[71] Katz v. United States, 389 U.S. 347 (1967).
[72] *See e.g.,* Olmstead v. United States, 277 U.S. 438, 457, 464–66 (1928); Goldman v. United States, 316 U.S. 129, 134–36 (1942).
[73] *Olmstead*, 277 U.S. at 457, 464–66; *see also Goldman*, 316 U.S. at 134–136.
[74] *See Katz*, 389 U.S. at 351–58.

approach.[75] The Court recognized that property rights are not the sole measure of Fourth Amendment violations, and it expanded Fourth Amendment protections to certain expectations of privacy.[76] Justice Harlan's concurrence created the reasonable expectation of privacy test, known as the *Katz* Test.[77] This two-pronged test includes both a subjective component and an objective component. The first prong is met when a "person ha[s] exhibited an actual (subjective) expectation of privacy[.]"[78] The second prong requires "that the expectation be one that society is prepared to recognize as reasonable."[79]

C. Jones Test

The previous property-centric theory of the Fourth Amendment was reinvigorated in 2012 by *United States v. Jones*.[80] The Court unanimously determined that around-the-clock tracking of a personal vehicle for weeks using a government-installed Global-Positioning-Service ("GPS") device was a search.[81] Despite the unanimity in the determination, the Court was split on the proper test. In a bare majority decision, the Court determined that the *Katz* test supplemented—instead of replaced—the traditional trespass theory and based their search determination on the application of the trespass test.[82] The Government physically occupied private property to install the GPS device, and "such a physical intrusion would have been considered a search within the meaning of the

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[75] *Id.* at 351.

[76] *See id.* at 353. The Court explained that it had previously held in *Silverman v. United States*, that "the Fourth Amendment governs not only the seizure of tangible items but extends as well to the recording of oral statements overheard without any technical trespass under local property law." 365 U.S. 505, 511 (1961). Once this is acknowledged along with the acknowledgement that the Fourth Amendment protects people and not places "against unreasonable searches and seizures it becomes clear that the reach of that Amendment cannot turn upon the presence or absence of a physical intrusion into any given enclosure." *Katz*, 389 U.S. at 353.

[77] *Katz*, 389 U.S. at 361 (Harlan, J., concurring).

[78] *Id.*

[79] *Id.* (internal quotation marks omitted).

[80] United States v. Jones, 565 U.S. 400 (2012).

[81] *Id.* at 404.

[82] *Id.* at 411.

Fourth Amendment when it was adopted."[83] *Jones* also suggested that the Fourth Amendment should be understood as the "preservation of th[e] degree of privacy against government that existed when the Fourth Amendment was adopted."[84] *Jones* clarified that either the traditional trespass test or the *Katz* reasonable expectation of privacy test would suffice to determine whether state action is a search under the Fourth Amendment.[85]

D. Third-Party Doctrine

The third-party doctrine limits the scope of the *Katz* test. This doctrine clarifies that "a person has no legitimate expectation of privacy in information he voluntarily turns over to third parties."[86] Even when the information given to a third party is given under the assumption it will be used for a *limited* purpose and the individual's confidence will not be betrayed, the third-party doctrine still applies.[87] The rationale behind the doctrine is that when an individual shares information with another, they are assuming the risk that that individual will reveal that information to the government.[88]

Smith v. State of Maryland solidified the third-party doctrine. In *Smith*, the Government's use of a pen register to intercept phone numbers dialed by the defendant was determined not to be a Fourth Amendment search under the *Katz* test.[89] The defendant had no reasonable expectation of privacy when he "voluntarily conveyed the numerical information" to the phone company.[90] Further, the defendant assumed the risk that the phone company would give the information of who he called to the police.[91]

Dissenting in *Smith*, Justice Marshall expressed his concern for the third-party doctrine. In his view, privacy is not an all-or-nothing

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[83] *Id.* at 404–05 (internal quotation marks omitted).
[84] *Id.* at 406 (internal quotation marks omitted).
[85] *Id.* at 411.
[86] Smith v. Maryland, 442 U.S. 735, 743–44 (1979).
[87] United States v. Miller, 425 U.S. 435, 443 (1976).
[88] *Id.*
[89] *Smith*, 442 U.S. at 735.
[90] *Id.* at 744.
[91] *Id.* at 745.

commodity.[92] All privacy should not be lost when a little bit of it is shared with another. Legitimate privacy expectations under *Katz* should not depend on the risks an individual is *assumed* to accept when sharing information, but on the risks he should be forced to accept in a free society.[93] Courts must evaluate the "intrinsic character" of law enforcement's investigation practices and compare that character to the basic values of the Fourth Amendment.[94] When "extensive intrusions" significantly jeopardize individuals' sense of security, "more than self-restraint by law enforcement is required."[95]

E. Downfall of the Third-Party Doctrine

Carpenter v. United States[96] significantly restricted the third-party doctrine as applied to technological advancements. The Court acknowledged that technology has enhanced the Government's ability to encroach on individuals' private lives.[97] As a result, the Fourth Amendment's job is "to place obstacles in the way of a too permeating police surveillance."[98] Courts must ensure that the degree of privacy against the Government that existed when the Fourth Amendment was adopted is still preserved even in the wake of technological advancements.[99]

The Court differentiated cell site location information ("CSLI") from information explicitly volunteered by individuals to third parties.[100] CSLI data constantly tracks a person's phone location, and users have no choice but to participate because cell phones have become so ingrained in modern life.[101] Additionally, *Carpenter*

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[92] *Id.* at 749 (Marshall, J., dissenting) ("Privacy is not a discrete commodity, possessed absolutely or not at all.").
[93] *Id.* at 750.
[94] *Id.* at 750–51.
[95] Smith v. Maryland, 442 U.S. 735, 751 (1979) (Marshall, J., dissenting).
[96] Carpenter v. United States, 138 S. Ct. 2206 (2018).
[97] *Id.* at 2214.
[98] *Id.* (internal quotation marks omitted).
[99] *Id.*
[100] *Id.* at 2217.
[101] *Id. See also* Susan Freiwald & Stephen Wm. Smith, *The Carpenter Chronicle: A Near-Perfect Surveillance*, 132 HARV. L. REV. 205, 219 (2018).

noted the low cost and effort required to compile CSLI when making its determination.[102]

Carpenter declined to extend the third-party doctrine to the collection of CSLI.[103] Due to the Court's decision to forego the application of the doctrine, it no longer is a bright-line categorical rule applied whenever data is shared with a third party. The third-party doctrine is not available when technological advancements have created a reasonable expectation of privacy and a lack of affirmative consent to how individual data is used.[104]

IV. FOURTH AMENDMENT ANALYSIS: IS IT A SEARCH?

King leaves open the issue of the constitutionality of IGG because *King* was decided in the context of DNA collection *after* an arrest is made, which is significantly different from using IGG to *identify* a suspect and *make* an arrest. When an arrest has yet to be made, the privacy interests at stake are greater. Neither the offender nor their family members have the same diminished expectation of privacy as someone who is already in police custody. Additionally, IGG uses DNA that shows genetic predispositions, unlike the DNA collected from the cheek swab in *King*, which also increases the value of the DNA and the privacy interests at stake. The government interests involved when using IGG are similar to those established in *King*. The legitimate government interests consist of accurate identification, public safety, and exonerating those wrongfully convicted of a prior crime. Therefore, since the privacy interests at stake are greater and the legitimate government interests are relatively the same, it is unclear whether the Court would conclude, as it did in *King,* that the government interests outweigh the privacy intrusion of IGG.

Moreover, when an arrest is made, probable cause has already been established and, thus, there is reason to believe the arrestee is the offender of the crime. When police use IGG, it is typically as a

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[102] *Carpenter*, 138 S. Ct. at 2217–18.

[103] *Id.* at 2209.

[104] *Id.* at 2218. *See also* Genevieve Carter, *The Genetic Panopticon: Genetic Genealogy Searches and the Fourth Amendment*, 18 NW. J. TECH. & INTELL. PROP. 311, 327 (2021).

last resort to generate leads because the case has turned cold and there is no probable cause to believe any certain person in the commercial DNA databases is or is related to the offender of the crime. Therefore, IGG cases are the classic example of "searching a person for evidence of a crime when there is no basis for believing the person is guilty of the crime."[105] Thus, when police are using IGG, they are conducting suspicionless searches and, like Justice Scalia discussed in his *King* dissent, their sole motive for doing so is for investigative purposes. The use of IGG could be considered a Fourth Amendment violation if it is used during a police investigation to create probable cause.

Further analysis must be done to determine whether IGG is a search under the Fourth Amendment. The *Jones* trespass test, *Katz* test and third-party doctrine, and *Carpenter* analysis are all applicable to IGG and, therefore, must all be assessed.

A. Jones Test

Under *Jones'* trespass analysis, the use of IGG to identify potential suspects would be considered a Fourth Amendment search. Commercial DNA databases grant law enforcement easy access to millions of people's DNA. DNA is a naturally created, unique, identifying number for each person. It is a part of one's person, and "the Fourth Amendment lists 'persons' *first* among the entities protected against unreasonable searches and seizures."[106] The Framers clearly wanted to protect our persons from the government, and genetic information is about as personal to our body as it gets. No matter how genetic information is obtained, DNA would have been protected during the adoption of the Fourth Amendment. Thus, searching through millions of profiles of DNA to either find an exact or relative match is a search under the Fourth Amendment.

B. The Katz Test and Third-Party Doctrine

Under the *Katz* reasonable expectation of privacy test, it is not likely that an offender who has submitted their own DNA to a commercial DNA database will be able to assert a Fourth

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[105] Maryland v. King, 569 U.S. 435, 466 (2013) (Scalia, J., dissenting).
[106] *Id.* at 469.

Amendment protection. This is because of the third-party doctrine, which specifies that when an individual voluntarily gives their DNA away to a third party, that individual can no longer assert that they "exhibited an actual expectation of privacy."[107] In revealing their DNA to another, the individual assumed the risk that the third party will convey the information to the government, even if the offender only revealed the information with the understanding that the company would only use the DNA to generate ancestorial information and create a family tree. Law enforcement could likely access the DNA from the third-party database without invoking the Fourth Amendment.

There is a chance, however, that the Court would still deem IGG to be a search when the offender submitted their own DNA to a third-party database. This is evidenced by a statement made by Justice Gorsuch in his dissenting opinion in *Carpenter*. Justice Gorsuch questioned whether the government "[c]an secure your DNA from 23andMe without a warrant or probable cause? *Smith* . . . say[s] yes it can—at least without running afoul of *Katz*. But that result strikes most lawyers and judges today—me included—as pretty unlikely."[108] Therefore, courts may still deem IGG to be a search, thus, triggering the Fourth Amendment, when an offender himself submits his DNA to a commercial DNA database.

The third-party doctrine analysis becomes less clear when the perpetrator did not give their DNA to a commercial database, but an offender's relative gave their DNA away. The relative assumed the risk when they decided to share their DNA—but does that mean the assumption of risk is then applied to all relatives of the individual who shared their DNA? Do all relatives now no longer have a reasonable expectation of privacy to their personal DNA? A *Carpenter* analysis better addresses the issue of when family members' DNA is used in IGG.

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[107] Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J., concurring).

[108] Carpenter v. United States, 138 S. Ct. 2206, 2262 (2018) (Gorsuch, J., dissenting).

C. Carpenter Analysis

Under *Carpenter*, the third-party doctrine would likely not apply when family members of the offender give their DNA to commercial DNA databases and, therefore, searching through their information to identify a non-user would constitute a Fourth Amendment search. Many commercial DNA databases allow users to consent and opt in to their own DNA being accessed by law enforcement when conducting investigations. If users choose to opt in, this will then serve as their affirmative consent required by *Carpenter.*

If the individual consents to opt in to the service and then commits a crime, police could likely access their DNA information because they no longer have a reasonable expectation of privacy. However, if an individual consents to the opt-in service and then a family member commits a crime, police should not be able to use the individual's DNA to quickly work their way to the perpetrator. An individual cannot give informed consent for all their family members, which is in essence what the consent agreements are asking users to do. Thus, relatives of commercial DNA database users are similar to the defendant in *Carpenter*, who did not affirmatively consent to giving cell phone location data to third parties. Therefore, it would be a Fourth Amendment search to use IGG and familial DNA in commercial databases to make an arrest and "more than self-restraint by law enforcement is required."[109]

* * *

Law enforcement officers are conducting suspicionless searches for investigative purposes when using IGG. Based on Fourth Amendment analysis, courts may determine IGG searches to be Fourth Amendment searches and the protections of the amendment to be triggered. To avoid potential Fourth Amendment violations as well as arbitrary and oppressive interference by law enforcement officers, IGG restrictions and guidelines need to be put in place. A few states and a federal executive agency have already taken the lead in establishing IGG regulation.

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[109] Smith v. State of Maryland, 442 U.S. 735, 751 (1979) (Marshall, J., dissenting).

V. CURRENT GOVERNMENTAL REGULATION

A. State Regulation

IGG has not faced significant scrutiny at the federal level, and state courts largely have taken a "hands-off" approach to regulating law enforcement's use of the technique.[110] However, Maryland, Montana, and Utah became the first states to pass regulation limiting the use of IGG in the United States.[111] All three pieces of legislation focus on the use of consumer DNA databases and restrict law enforcement's ability to use them as a tool during investigations in an effort to ensure the genetic privacy of the accused and their relatives.

1. Maryland

Maryland passed the world's first law regulating the use of IGG in 2021.[112] Maryland's law puts in place several safeguards to significantly limit the Government's use of the investigative tool and better protect the privacy of non-suspects. Maryland state law requires law enforcement to obtain judicial approval before using the investigative tool, and judicial authorization can only be granted as a last resort for investigating violent crimes or threats to public safety.[113] IGG is only permitted on databases that provide explicit notice to and seek affirmative consent from users that law enforcement may use their data to investigate crimes.[114] Additionally, law enforcement must obtain informed consent to collect DNA from non-suspects unless it compromises the investigation.[115]

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[110] Univ. of Balt. L. Rev. Staff, *What's Next for Forensic Genetic Genotyping in Maryland?*, U. BALT. L. REV. (Dec. 18, 2022), https://ubaltlawreview.com/2022/12/18/whats-next-for-forensic-genetic-genotyping-in-maryland [https://perma.cc/9HRE-ZYJS].

[111] Virginia Hughes, *Two New Laws Restrict Police Use of DNA Search Method*, N.Y. TIMES (May 31, 2021), https://www.nytimes.com/2021/05/31/science/dna-police-laws.html [https://perma.cc/U3D4-4S93].

[112] Univ. of Balt. L. Rev. Staff, *supra* note 110.

[113] *Id.*

[114] *Id.*

[115] *Id.*

Maryland's law also requires law enforcement to complete certain administrative duties. For example, police must compile an annual public report on IGG practices. [116] Labs conducting testing for IGG must be licensed, and the Office of Health Care Quality must train technicians. [117] Additionally, Maryland grants access to defendants seeking postconviction relief.[118] Finally, Maryland imposes consequences for violations of the IGG statute, such as unauthorized disclosure of information or failure to destroy data and allows for financial compensation for people whose genetic data was wrongfully disclosed or collected.[119]

2. Montana

Montana's law is much less restrictive than Maryland's IGG law. The only restriction the state places on law enforcement use of IGG is that police are required to obtain a search warrant based on probable cause to access search results from a consumer DNA database.[120] However, a warrant is not required if the consumer previously waived their right to privacy.[121] Additionally, the law does not restrict the use of IGG to certain types of crimes.[122]

3. Utah

On March 1, 2023, Utah's state legislature passed their IGG bill, known as the "Sherry Black Bill."[123] As of March 29, 2023, Utah Governor Spencer Cox has yet to sign the bill into law. The bill establishes requirements that a law enforcement agency must meet in order to conduct IGG and requires certain reporting requirements for IGG searches.[124] A law enforcement agency may request an IGG service or use of a consumer DNA database if law enforcement

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[116] *Id.*
[117] Univ. of Balt. L. Rev. Staff, *supra* note 110.
[118] *Id.*
[119] *Id.*
[120] MONT. CODE ANN. § 44-6-104(1) (2021).
[121] *Id*.
[122] *See id.*
[123] Bridger Beal-Cvetko, *Legislature Passes 'Sherry Black Bill' to Regulate Genealogy Search by Law Enforcement*, KSL (Mar. 1, 2023), https://www.ksl.com/article/50590451/legislature-passes-sherry-black-bill-to-regulate-genealogy-search-by-law-enforcement [https://perma.cc/JH5N-DQ8E].
[124] S.B. 156, 65th Leg., Gen. Sess. (Utah 2023).

obtained a DNA profile through their investigation and "reasonably believe the profile is attributable to the perpetrator of a crime, the remains of an unidentified individual, or a missing or unknown individual."[125] The investigation must be for a violent felony or to identify a missing or unknown person.[126] A routine CODIS search must have revealed no DNA matches to the DNA profile.[127] Additionally, law enforcement, the Bureau of Forensic Science, and the prosecuting agency must consult whether use of IGG is an appropriate and necessary step in the development of the case.[128] Finally, law enforcement and the prosecuting agency must commit to further investigation of the case if IGG produces information that may contribute to solving the case.[129] All factors must be satisfied in order for law enforcement to be eligible to use IGG in Utah.

Utah's bill also provides limitations on arrests and charges based on certain types of genetic information.[130] Before a person may be arrested in a case in which IGG aided in the identification of the individual as a suspect, law enforcement must verify with confirmatory genetic testing that the DNA obtained from the crime scene could have originated from the individual.[131] If sufficient evidence outside of the use of IGG independently supports the individual's arrest, then law enforcement is not required to verify the identification.[132]

B. Agency Regulation—DOJ Interim Policy

In November 2019, the United States Department of Justice ("DOJ") enacted an interim policy to provide guidance and establish some degree of standardization of the use of IGG in federal cases.[133]

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[125] *Id.*
[126] *Id.*
[127] *Id.*
[128] *Id.*
[129] *Id.*
[130] S.B. 156, 65th Leg., Gen. Sess. (Utah 2023).
[131] *Id.*
[132] *Id.*
[133] *Interim Policy: Forensic Genetic Genealogical DNA Analysis and Searching*, U.S. DEP'T OF JUST. (Sept. 2, 2019), https://www.justice.gov/olp/page/file/1204386/download [https://perma.cc/H3XX-QYHV] [hereinafter DOJ Interim Policy].

The DOJ Interim Policy exclusively applies to criminal investigations in which DOJ has exclusive or concurrent jurisdiction, criminal investigations or federal agencies receiving DOJ funds to conduct IGG, and criminal investigations in which DOJ employees conduct genealogical research on leads generated through the use of IGG.[134] Additionally, the DOJ explicitly states that the policy should be used to provide internal guidance and does not create any substantive or procedural rights enforceable against the United States.[135]

The DOJ Interim Policy restricts the use of IGG searches to identify offenders of violent crimes,[136] exonerate innocent suspects, and identify unidentified human remains from suspected homicide cases.[137] A prosecutor may authorize the use of IGG for other violent crimes "when the circumstances surrounding the criminal act(s) present a substantial and ongoing threat to public safety or national security."[138] Before investigators can submit the DNA sample for IGG purposes, the sample must first be uploaded to CODIS, and "subsequent CODIS searches must have failed to produce a probative and confirmed DNA match."[139] Investigators must reasonably believe a "putative perpetrator"[140] deposited the DNA sample during, or incident to, the commission of a crime.[141]

Once investigators meet the requirements to use IGG, they then must identify themselves as law enforcement to commercial DNA

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[134] *Id.* at 2.

[135] *Id.* at 1 n.1.

[136] The DOJ defines "violent crimes" as "any homicide or sex crime as well as other serious crimes and criminal offenses designated by a genetic genealogy service for which IGG has been authorized by that service." *Id.* at 4 n.15.

[137] *Id.* at 4.

[138] DOJ Interim Policy, *supra* note 133, at 4–5.

[139] *Id.* at 5.

[140] The DOJ Interim Policy defines a "putative perpetrator" as "one or more criminal actors reasonably believed by investigators to be the source of, or a contributor to, a forensic sample deposited during, or incident to, the commission of a crime." *Id.* at 4 n.17. Additionally, the DNA sample must be "collected from a crime scene, a person, an item, or a location connected to the criminal event. *Id.* at 2 n.6.

[141] *Id.* at 4 n.17.

databases before engaging in IGG.[142] The DOJ Interim Policy also limits investigators' use of IGG to certain commercial databases.[143] Investigators may only use the genetic databases that provide explicit notice to their users that law enforcement may access their information for IGG purposes.[144]

The DOJ Interim Policy specifically prohibits the arrest of any person based solely on a genetic association generated using IGG.[145] The policy further emphasizes IGG is only a "law enforcement technique used to *generate* investigative leads."[146] Once there is a match, more investigative work must be done in order to determine the nature of the genetic association and whether the lead is credible.[147] If IGG and subsequent genealogy research results in the identification of a third party who is more closely related to the suspect profile than the associated commercial database user, investigators must seek informed consent from the third party before they can obtain reference DNA samples from the party.[148] However, if investigators conclude, based on reasonable grounds, that the collection of informed consent will compromise the investigation, then investigators must seek approval from the prosecutor instead.[149] Additionally, investigators must obtain a search warrant before a vendor lab conducts IGG analysis on a covertly-collected reference sample.[150]

If a suspect is arrested and charged with a criminal offense *before* the completion of IGG, the investigative agency shall cease all testing when the tested sample can be preserved and request the sample be returned to the agency from the commercial lab.[151] If a suspect is arrested and charged with a criminal offense *after* an IGG profile has been entered into a commercial service, investigators

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[142] *Id.* at 6.
[143] *Id.*
[144] DOJ Interim Policy, *supra* note 133, at 6.
[145] *Id.* at 7.
[146] *Id.* (emphasis added).
[147] *Id.*
[148] *Id.* at 6.
[149] DOJ Interim Policy, *supra* note 133, at 6.
[150] *Id.*
[151] *Id.* at 7.

shall make a formal request that all IGG profiles and associated information be removed from its records and provided directly to the agency.[152] Under the DOJ Interim Policy, all IGG profiles, account information, and data shall be retained by the investigative agency for potential use during prosecution and subsequent judicial proceedings.[153] If criminal prosecution results, all information and data connected to the IGG shall be destroyed *only after* entry of the appropriate court order.[154]

VI. PRIVATE COMPANIES' REGULATION

A. Companies' Terms of Service

Many of the major direct-to-consumer companies have updated their terms of service to attempt to limit law enforcement's access to their databases for investigatory purposes. Law enforcement access has either been limited through a complete ban or through policies that require users to opt in to law enforcement access.

1. 23andMe

23andMe requires law enforcement inquiries to follow a valid legal process to gain access to the company's services.[155] In its Privacy Statement, 23andme reiterates that it will not provide information to law enforcement unless required by law to comply with a valid court order, subpoena, or search warrant.[156] If law enforcement follows a legal process to obtain user data, 23andMe is "prepared to exhaust available legal remedies to protect customer privacy."[157] If the company is compelled to disclose a user's personal information to law enforcement, the company promises to try its best to provide the user with prior notice, unless prohibited from doing so by law.[158] Additionally, when users accept the company's

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[152] *Id.*
[153] *Id.*
[154] DOJ Interim Policy, *supra* note 133, at 8.
[155] *Privacy Statement*, 23ANDME, https://www.23andme.com/legal/privacy/full-version/ [https://perma.cc/X2XG-EUC9] (last updated Dec. 14, 2022).
[156] *Id.*
[157] *Id.*
[158] *Id.*

Terms of Service, they are confirming that they will not use the company's services "for any investigative forensic genealogy uses."[159]

2. FamilyTreeDNA

In December 2018, FamilyTreeDNA ("FTDNA")[160] adopted a policy permitting federal investigators to participate in its database to solve violent crimes and identify human remains.[161] The company quietly and voluntarily agreed to the arrangement with the Federal Bureau of Investigation ("FBI"), granting them access to its database of more than 2 million users.[162] This arrangement was the first known agreement by a commercial site to provide services to law enforcement without a subpoena or warrant.[163] In addition to the agreement, the company's genetic testing lab, Gene by Gene, agreed to create data profiles from the DNA samples provided by the FBI, which then could be uploaded to other familial DNA sites.[164]

FTDNA received backlash from this partnership because it failed to disclose to its users that it was sharing users' personal and sensitive DNA data with the FBI.[165] As a result, FTDNA changed its Terms of Service.[166] Now, investigators must obtain written permission[167] from FTDNA before law enforcement may use

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[159] *Terms of Service*, 23ANDME, https://www.23andme.com/legal/terms-of-service/ [https://perma.cc/9M66-TDDS] (last updated June 8, 2022).

[160] FamilyTreeDNA is one of the country's largest at home genetic testing companies. Matthew Haag, *FamilyTreeDNA Admits to Sharing Genetic Data with F.B.I.*, N.Y. TIMES (Feb. 4, 2019), https://www.nytimes.com/2019/02/04/business/family-tree-dna-fbi.html [https://perma.cc/5MCM-K2MF].

[161] *Id.*

[162] *Id.*

[163] *Id.*

[164] *Id.*

[165] *Id.*

[166] Haag, *supra* note 160.

[167] *FamilyTreeDNA Law Enforcement Guide*, FAMILYTREEDNA, https://www.familytreedna.com/legal/law-enforcement-guide [https://perma.cc/69BM-CFYS] (last visited Feb. 24, 2023). Permission is only granted after the required documentation is submitted, reviewed, and approved by FTDNA. *Id.* FTDNA will only grant law enforcement access when law enforcement is trying to identify the remains of a deceased individual or to a identify a perpetrator of homicide, sexual assault, or abduction. *Id.*

FTDNA's services for any IGG purposes.[168] Additionally, law enforcement is required to register all forensic samples and genetic files prior to uploading them to the database.[169] FTDNA requires a valid legal process in order to consider producing any additional user information that is not accessible to the standard user.[170]

FTDNA users can also choose whether to make their information available for law enforcement searches in a process known as "Investigative Genetic Genealogy Matching" ("IGGM").[171] In order for a user's information to be accessible by law enforcement, the user must both opt in to the company's matching service and opt in to the IGGM service.[172] It is unclear whether FTDNA users are automatically opted in to the IGGM service.[173]

3. GEDmatch

In May 2019, GEDmatch took its own approach to address the issue of IGG and law enforcement use of the company's database.[174] All users who registered for GEDmatch prior to May 18, 2019, were automatically opted out of the company's law enforcement matching service. This update required existing users to log in to their accounts and manually opt in to allow law enforcement access to their data. In contrast, users who register after May 18, 2019, are required to decide at the time of registration whether to opt in to the IGG service, where the "opt-in" choice is selected by default.[175]

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[168] *Id.*

[169] *Id.*

[170] *Id.*

[171] *Opting in to and out of IGGM*, FAMILYTREEDNA, https://help.familytreedna.com/hc/en-us/articles/4413988580623-Opting-in-to-and-out-of-IGGM-#opting-out-of-iggm-0-1 [https://perma.cc/B7YL-NKTB] (last visited Feb. 26, 2023).

[172] *Id.*

[173] *See id.*

[174] Ellen McRae Greytak, *Genetic Genealogy for Cold Case and Active Investigations: 2021 Update*, THE ISHI REP. (Nov. 2021), https://promega.foleon.com/theishireport/the-ishi-report-november-2021/genetic-genealogy-for-cold-case-and-active-investigations-2021-update/ [https://perma.cc/7WAU-AKWL].

[175] *Id.*

Thus, new users must manually opt out of the service to protect their information from being accessed by police during investigations.[176]

If users choose to opt in, their DNA kit will be compared to kits submitted by law enforcement attempting to identify unidentified human remains and perpetrators of violent crimes.[177] If users choose to opt out, their DNA kit will still be compared to kits submitted by law enforcement to identify unidentified human remains, but it will not be compared with kits submitted to identify perpetrators of violent crimes.[178] The GEDmatch's Terms of Service state that "[t]he operators of GEDmatch encourage everybody" to select the opt-in option.[179]

B. Police Navigations Around Companies' Policies

Despite private companies creating their own restrictions regarding IGG, police have found ways to navigate around these barriers for their investigations. For example, in 2019, a detective approached Parabon about investigating a brutal assault of an elderly woman.[180] The woman fortunately survived the attack, but as a result, her case did not qualify as a "violent crime" and Parabon turned it down.[181] The detective then went straight to GEDmatch to ask for an exception to access its database for IGG purposes due to the brutality and time-sensitive nature of the case.[182] GEDmatch directly asked Parabon to work on the case despite it violating

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[176] Nicole Wetsman, *Genetic Databases that Identified Golden State Killer Acquired by Crime Scene DNA Company*, VERGE (Dec. 10, 2019, 1:17 PM), https://www.theverge.com/2019/12/10/21005443/golden-state-killer-genetic-database-identity-company-acquisition-crime-scene-dna-data [https://perma.cc/88SL-KUK9].

[177] GEDmatch defines "violent crime" as "murder, nonnegligent manslaughter, aggravated rape, robbery, or aggravated assault." *Terms of Service and Privacy Policy*, GEDMATCH (Dec. 30, 2021), https://www.gedmatch.com/terms-of-service-privacy-policy/ [https://perma.cc/C384-N9W].

[178] *Id.*

[179] *Id.*

[180] Greytak, *supra* note 174.

[181] *Id.*

[182] *Id.*

GEDmatch's Terms of Service.[183] Parabon proceeded with IGG analysis to help the investigation.[184]

Additionally, companies' opt-in system does not protect all information from the police.[185] In 2019, a federal judge in Florida issued a search warrant to an Orlando detective granting full access to the entire GEDmatch database, which at the time had over a million users.[186] GEDmatch complied with the warrant instantly.[187] The warrant issued by the Florida judge signifies a court's willingness to override the privacy policies of commercial DNA databases.

VII. POLICY RECOMMENDATION

IGG is only going to become increasingly powerful as people continue to voluntarily submit their DNA to commercial DNA databases and the technology advances to solve active investigations quickly and cheaply. The time for widespread regulation is now, before IGG becomes a typical procedure in criminal investigations and a widely litigated issue. There is currently minimal regulation at the state and federal levels, and as a society we have put most of our protection in the hands of commercial companies. Private companies' terms of service should not be society's strongest tool to protect our privacy and ensure our genetic DNA is not easily accessed by law enforcement.

Since IGG is a relatively new practice and has mainly been used to solve cold cases decades later, the issue of IGG has rarely been litigated and has not been appealed until recently. Identification through IGG has mainly led, if the offender is still alive, to guilty pleas and confessions, even when someone else was previously

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[183] *Id.*
[184] *Id.*
[185] Wetsman, *supra* note 176.
[186] Kashmir Hill & Heather Murphy, *Your DNA Profile is Private? A Florida Judge Just Said Otherwise*, N.Y. TIMES (Nov. 5, 2019), https://www.nytimes.com/2019/11/05/business/dna-database-search-warrant.html [https://perma.cc/H8CF-C5X2].
[187] *Id.*

convicted of the crime.[188] However, the first genetic genealogy arrest to reach trial occurred in June 2019, which resulted in the first conviction of a person identified through IGG.[189] At trial, IGG was introduced through the testimony of a detective who explained how a semen sample collected from a rape victim led to two second cousins of the suspect and then the named defendant.[190] The defense did not raise any issue about the use of IGG in the investigation.[191] In September 2022, the Iowa Supreme Court heard oral argument in the first case to reach a state supreme court involving a challenge related to results of an IGG database search.[192] The defense appealed on the issue of whether the "trial court erred in denying defendant's motion to suppress where the warrantless extraction of his DNA profile violated his rights under the Fourth Amendment of the United States Constitution and article I, section 8 of the Iowa

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[188] Heather Murphy, *Genealogy Sites Have Helped Identify Suspects. Now They've Helped Convict One*, N.Y. TIMES (July 1, 2019), https://www.nytimes.com/2019/07/01/us/dna-genetic-genealogy-trial.html [https://perma.cc/6WNH-AAXV]; *see also* Peter Aldhous, *Genetic Genealogy Helped Finally Crack the 1996 Murder of 18-Year-Old Angie Dodge*, BUZZFEEDNEWS (May 16, 2019, 4:11 PM), https://www.buzzfeednews.com/article/peteraldhous/angie-dodge-cold-case-murder-genetic-genealogy-parabon [https://perma.cc/YNH2-6G7Y].

[189] Murphy, *supra* note 188.

[190] *Id.*

[191] *Id.*

[192] Jennifer Lynch, *EFF Challenges Surreptitious Collection of DNA at Iowa Supreme Court*, ELEC. FRONTIER FOUND. (Apr. 9, 2021), https://www.eff.org/deeplinks/2021/04/eff-challenges-surreptitious-collection-dna-iowa-supreme-court [https://perma.cc/DX37-EPGD]. In *State v. Burns*, No. 20-1150 (Iowa filed Dec. 6, 2021), the defendant was charged with a murder that occurred in 1979. *Id.* The police had no leads in the case for years. *Id.* In 2018, investigators worked with Parabon Nanolabs to upload a crime scene DNA profile to GEDmatch. *Id.* The police linked the crime scene DNA to three brothers, including the defendant in *Burns*. *Id.* Police then surveilled the defendant until they could collect something containing his DNA. *Id.* The police found a used straw he left at a restaurant, extracted a profile from DNA on the straw, matched it to DNA found at the crime scene, and arrested Burns. *Id.*

Constitution."[193] As of March 9, 2023, the Iowa Supreme Court has not yet released their decision in this case.

As the practice of IGG becomes more widely adopted in active investigations, the issue of IGG and its constitutional use is going to be litigated more on both the trial and appellate levels. Thus, case law will start to dictate how investigators can use IGG. To avoid piecemeal judicial construction of IGG regulation, the executive and legislative branches need to address the issue and codify boundaries around the use of IGG now. This issue can and should be fully addressed both on the federal and state level to ensure that both federal and state investigations have IGG guidelines. Laws need to be enacted to create enforceable guidelines for law enforcement's use of IGG to avoid unconstitutional searches and invasions of privacy.

A. Banning IGG Completely

While enacting a complete ban on IGG might appear to be an appropriate response from a public trust and Fourth Amendment protection perspective, it is naïve and unrealistic. To determine what is reasonable, states must balance individuals' privacy interests with the public interest of identifying violent offenders. The weight of solving violent crimes is too significant and legitimate to justify a complete ban of IGG. In fact, some states have proposed legislation to prohibit IGG entirely, but all attempts have failed.[194] IGG is an investigative technique that will continue to be used despite individual legislators' attempts to eradicate the practice. Thus, legislatures must learn how to properly regulate it.

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[193] *Case No. 20-1150*, IOWA JUD. BRANCH, https://www.iowacourts.gov/iowa-courts/supreme-court/supreme-court-oral-argument-schedule/case/20-1150 [https://perma.cc/V854-MPCA] (last visited Mar. 9, 2022).

[194] Nicole Wetsman, *States Pass Laws Limiting use of DNA Searches for Criminal Investigations*, VERGE (June 1, 2021, 8:48 AM), https://www.theverge.com/2021/6/1/22462859/dna-genetic-genealogy-criminal-laws-maryland-montana [https://perma.cc/2VE7-5T39]. Utah originally tried to pass legislation that would completely ban the use of IGG, however, it was not enacted. *Id.*

B. DOJ Interim Policy

While the DOJ Interim Policy is a start, it is an insufficient solution to the issue of federal regulation of IGG. Most of the "requirements" imposed by the policy are written more as a suggestion than a bright-line rule, and it provides no clear penalty for violations.[195] While agencies are typically better suited than Congress to regulate ever-changing technological advancements, the DOJ Interim Policy has not been revised in over three years. The Interim Policy is long overdue for reevaluation. The DOJ's original press release for the Interim Policy states, "[a] final Department policy on forensic genetic genealogy will be issued in 2020."[196] This has yet to happen.

To properly evaluate the DOJ Interim Policy, the DOJ should staff a committee of IGG experts to help inform the regulation. The DOJ could also partner with the Coalition for Genetic Data Protection, which consists of three of the biggest DNA testing and analysis companies—Ancestry, 23andMe, and Helix.[197] The idea behind the coalition is that it allows for the industry to inform Congress on what the "best practices are for protecting customers' data[.]"[198]

Once the DOJ Interim Policy is reassessed and finalized, it should be codified into the Code of Federal Regulation. The codified regulation would allow for enforceable legal requirements and remedies for violations in federal investigations. The policy should therefore consist of definite rules that could be enforceable at law, such as compensation for people whose genetic data was wrongfully

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[195] DOJ Interim Policy, *supra* note 133 (this is evidenced by the policy's strategic use of the word "shall" instead of "must").

[196] Press Release, U.S. Dep't of Just., Department of Justice Announces Interim Policy on Emerging Method to Generate Leads for Unsolved Violent Crimes (Sept. 24, 2019), https://www.justice.gov/opa/pr/department-justice-announces-interim-policy-emerging-method-generate-leads-unsolved-violent [https://perma.cc/89PG-G5C5].

[197] Alex Gangitano, *DNA Testing Companies Launch New Privacy Coalition*, HILL (June 25, 2019, 6:00 AM), https://thehill.com/regulation/lobbying/450124-dna-testing-companies-launch-new-privacy-coalition/ [https://perma.cc/X2CT-JG8K].

[198] *Id.*

disclosed, collected, or failed to be properly destroyed. Additionally, if investigators do not properly follow the required IGG legal procedures, it could result in the suppression of evidence that resulted from improper IGG procedures.

C. State Regulation

There is still much to learn about how to properly regulate IGG since the investigative technique is only five years old, and there is very little existing regulation to see what works. The remaining forty-seven states should follow in the footsteps of Maryland, Montana, and Utah and experiment with legislation that aligns with the privacy interests and crime-solving needs of each respective state. "It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."[199] Each state should take advantage of our federal system and act as a laboratory to allow lawmakers to develop a better understanding of IGG and when it should properly be utilized.

As states start to experiment with IGG regulation, states should use Montana's law as a floor while striving for regulation closer to Maryland's and Utah's IGG laws. At the bare minimum, states should require law enforcement to obtain a search warrant based on probable cause to use IGG. IGG is a search of people's most personal property—their familial DNA—thus it should require the same legal process as any other Fourth Amendment search. States should also follow both Maryland's law and the DOJ Interim Policy by only using IGG as a last resort technique after all other investigative processes have been exhausted. This will allow law enforcement to rely on the technique only when it is necessary. Additionally, IGG should exclusively be used to identify unknown remains, exonerate falsely imprisoned persons, and in violent crime cases. States must determine what types of crimes should be considered violent crimes, but homicide, sex crimes, and abduction should be included.

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[199] New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

If states require a search warrant to use IGG, then states must also determine what information is needed to execute a valid search warrant. The Federal Rules of Criminal Procedure require a warrant to "identify the person or property to be searched, [and] identify any person or property to seized."[200] The nature of IGG makes adhering to this rule difficult because if IGG is being used, it likely means there are no leads. If there are no leads, police do not know the person or property that will be searched, and they will not be able to present a concrete and particularized search warrant to a judge. To address the issue, states could require police to limit their search of direct-to-consumer databases to DNA profiles that are a true match to the suspect's DNA sample. This way, the search will only result in a match if the offender themselves submitted a commercial DNA test and, thus, family members' DNA will not be involved in the investigation. States could also require searches be limited to known demographics about the offender, i.e., only males of a certain age in a certain geographic area. Alternatively, states could follow in the Florida federal judge's footsteps and grant access to the entire database, however, it is hard to see how this policy aligns with the spirit behind requiring concrete and particularized search warrants.

IGG should only be used as an investigative tool for identification purposes rather than as a primary source of evidence of criminal wrongdoing. DNA evidence demonstrates only that an individual's genetic material was at a given location, not that the person was present during or guilty of the crime. There is also a chance of false positives, and if the entire investigation is solely based on a false positive identification, the whole investigation is invalid. Therefore, IGG should only be used to generate a lead, and investigators will then need to build their case against the alleged offender.

To ensure that law enforcement have more information on an alleged offender besides a positive IGG identification, states could adopt a policy that prohibits evidence of IGG from being used in criminal trials. This may prevent prosecutors and courts from overinterpreting or misusing genetic identification as a source of

[200] Fed. R. Crim. P. 41.

evidence. Moreover, a jury may put more weight on a potential DNA match than other evidence because it is more scientific than other evidence, and in theory, it places the person at the scene of the crime. To avoid the misuse of IGG in criminal investigations and trials, IGG should only be used once all other avenues of investigation have been exhausted.

VIII. CONCLUSION

Law enforcement can now identify violent offenders and human remains previously deemed unidentifiable through the investigative tool of IGG. IGG will only become increasingly accessible and powerful as technology becomes more equipped to solve crimes quickly. The Idaho Murders investigation highlights how near society is to the future of IGG being used to name an alleged offender in an active investigation.

Despite growing privacy concerns associated with the technique, IGG remains a highly unregulated field. Several states and the DOJ have taken steps to restrict law enforcement use of IGG and protect the privacy of individuals. However, this is not enough. Forty-seven states have no IGG regulation, and the DOJ Interim Policy is legally unenforceable. The remaining states must develop comprehensive regulations to avoid IGG infringing upon individuals' Fourth Amendment right against unreasonable searches. Additionally, the DOJ needs to reevaluate and codify its policy to ensure that IGG regulation is legally binding and enforceable at the federal level. Therefore, both the legislative and executive branches must act to ensure investigators have proper IGG guidelines and no longer operate in the wild west of IGG.