NFSU JOURNAL OF FORENSIC JUSTICE

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

THE LINKÖPING MURDER CASE: A 16-YEAR MANHUNT AND THE PIVOTAL ROLE OF FORENSIC GENETIC GENEALOGY

Annwesha Mazumdar[1], Amit Kumar Choudhary[2]

Abstract: *This paper examines the notable double murder case in Sweden, which remained unsolved for 16 years until it was significantly advanced by the application of genetic genealogy. The Linköping double murder case resulted in the deaths of an eight-year-old child and a 56-year-old lady, both of whom were fatally stabbed on a public street in Linköping, Sweden. Despite the culprit leaving DNA at the crime site, the 15-year investigation, which involved over 9,000 interrogations and bulk DNA screens of over 6,000 males, yielded no actionable information about the assailant's identity. The Swedish Police Authority became interested in investigative genetic genealogy (IGG) when it was successfully implemented in the United States. Through extensive DNA analysis—encompassing whole-genome sequencing and genotype imputation DNA datasets were developed and explored within genealogy platforms such as Family Tree DNA and GEDmatch. This diligent research identified several distant relatives, facilitating the construction of family trees. As a consequence of this genealogical inquiry, two brothers emerged, one of whom matched the samples collected from the crime site using conventional STR profiling. He later acknowledged to the killings during an initial police interrogation and was found guilty. The study emphasises the importance of thorough forensic analysis and investigative approaches in successfully resolving this case. It highlights the importance of collecting and analyzing DNA evidence, gathering witness testimonies, and leveraging genealogical databases.*

Keywords*- Forensic Genetic Genealogy, Cold cases, DNA Evidence, Crime Scene, Murder case*

I. INTRODUCTION

The Linköping double murder case remains one of the most confusing and terrible criminal cases in Swedish history. On October 19, 2004, Mohammad Ammouri, an eight-year-old kid, and Anna-Lena Svensson, a 56-year-old woman, were fatally stabbed in Linköping, Sweden, in what appeared to be a random attack. The crime remained unexplained for 16 years until a breakthrough in forensic genetic genealogy led to Daniel Nyqvist's arrest and conviction in 2020. This study investigates the essential features of the inquiry, including the use of forensic genetic genealogy and the importance of this advanced technology in current criminal investigations. The arrest of the Golden State Killer in 2018, which had been unsolved for almost 40 years, sparked great interest in the notion of forensic genetic genealogy[1].

This discovery revealed the technique's ability to solve notoriously difficult cases that had previously been classified as cold owing to a lack of leads or matches in law enforcement DNA databases. Forensic genetic genealogy played a crucial role in the Linköping double murder case. The notion of pedigree is fundamental to genealogy and genetics.

Human genetics emerged from the study of character inheritance within families, with the genealogical approach serving as the primary instrument for decades. In genetics, the terms genealogy and pedigree are synonymous.

Forensic or investigative genetic genealogy (IGG) has arisen as a new and fast expanding discipline of forensic research. SNP markers are the primary core concept and key rollers of this method. SNP data, which often contain more than half a million markers, are used to infer distant connections. In forensics, relationship matching and expanded SNP analysis are used to identify a suspect or a missing individual. There is now a considerable demand in forensic genetics to not only comprehend the fundamental theories for inferring relatedness, but also to comprehensively study the DNA technologies and data utilised in IGG (investigative genetic genealogy).

[1] Research Intern, Regional Forensic Science Laboratory, Durgapur, West Bengal.
[2] Forensic Professional, Central Forensic Science Laboratory, Kolkata.

[1] George M Dery III, 'Can a Distant Relative Allow the Government Access to Your DNA: The Fourth Amendment Implications of Law Enforcement's Genealogical Search for the Golden State Killer and Other Genetic Genealogy Investigations' (2019) 10 Hastings Sci. & Tech. LJ 103.

NFSU JOURNAL OF FORENSIC JUSTICE

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

Traditional forensic approaches have hit a stalemate, with no matches discovered in current criminal DNA databases. The choice to use genetic genealogy was a deliberate one, with the goal of investigating the previously unexplored possibilities of distant familial DNA links. Investigators were able to identify the suspect's relatives and establish a family tree after uploading the crime scene DNA to a public genealogy database. This genealogy investigation resulted in the identification and subsequent arrest of Daniel Nyqvist.

II. CASE BACKGROUND

On October 19, 2004, Mohammad, an 8-year-old of Iraqi descent, was stabbed to death by an unknown criminal while on his way to school. Anna-Lena, a 56-year-old Swedish woman, witnessed the assault from her nearby house. The perpetrator then attacked her, causing several stab wounds. The attacks were deadly, and both the kid and the lady died of their injuries. The crime site occurred at Åsgatan in Linköping, where the victims were recovered with several stab wounds.

The initial response included securing the crime scene, gathering physical evidence such as a knitted cap (likely worn by the perpetrator) left near the crime scene and the murder weapon, a butterfly knife[2]. The evidence was retrieved from the crime site for forensic testing and witness interviews. Detailed photographs and sketches of the crime scene were taken to document the evidence and the layout of the scene. The collected evidence, including the DNA on the murder weapon and hat, was meticulously stored for future processing[3].

III. FORENSIC TECHNIQUES APPLIED IN THE INVESTIGATION

Fingerprints and DNA samples collected from the scene of crime were examined. Autopsies indicated that both individuals died because of numerous stab wounds. The method of death was identified as homicide, with the cause being deadly stab wounds[4]. Toxicological examinations were performed to search for any substances that might have impacted the perpetrator or victims.

Witness profiles and statements were utilised to identify possible lists of suspects. It was found that the victims do not know each other[5]. The murderer had no link with the victims and was mentally ill, targeting random individuals. Police also indicated that they suspected the suspect was in his twenties and probably suffered from mental health concerns[6]. In 2010, a sketch of the suspect was published[7]. The drawing and case were discussed on SVT's crime show, Veckans brott, on October 19, 2010, the anniversary of the killings[8]. In 2018, authorities released a second sketch of the suspect. This time, it was built in the Netherlands using the suspect's DNA profile, a procedure that was first utilised in Sweden at the time.

The drawing prompted more than 100 additional suggestions from the public, but no arrests were made[9]. The investigation into the Linköping double murders was the second largest in Swedish history. Over 9000 people were probed using evidence and witness statements. Psychological profiling was done to better understand the perpetrator's likely motivations and behaviour.

The investigation initially relied on traditional forensic methods such as DNA matching

[2] '5 Key Details about Mohammed Ammouri and Anna-Lena Svensson's Murder: Details Explored as Netflix Drops The Breakthrough' *Sportskeeda* (2025) <https://www.sportskeeda.com/us/shows/5-key-details-mohammed-ammouri-anna-lena-svensson-s-murder-details-explored-netflix-drops-the-breakthrough>.

[3] 'Man on Trial for Murder after DNA Hit on Genealogy' *RTE News* (2020) <https://www.rte.ie/news/world/2020/0915/1165379-sweden-dna-trial/>.

[4] '5 Key Details about Mohammed Ammouri and Anna-Lena Svensson's Murder: Details Explored as Netflix Drops The Breakthrough' (n 2).

[5] '5 Key Details about Mohammed Ammouri and Anna-Lena Svensson's Murder: Details Explored as Netflix Drops The Breakthrough' (n 2).

[6] 'Sweden: Man Goes on Trial for 2004 Murder after DNA Matched to Genealogy Site' *The Guardian* (2020) <https://www.theguardian.com/world/2020/sep/15/man-on-trial-in-sweden-for-double-murder-after-15-year-dna-wait>.

[7] 'Åh Nej, Sidan Kunde Inte Hittas' <https://polisen.se/Ostergotland/Aktuellt/Pressmeddelanden/Ostergotland/Polisen-behover-hjalp-med-att-identifiera-en-man>.

[8] 'Dubbelmordet i Linköping Tas Upp i Nytt Tv-Program' (2010) <https://www.nt.se/nyheter/linkoping-/artikel/dubbelmordet-i-linkoping-tas-upp-i-nytt-tv-program/rkwn8qvr>.

[9] 'Linköping Double Murder Case Trial to Take Place Later This Month' <https://www.sverigesradio.se/artikel/7544800>.

within law enforcement databases, bloodstain pattern analysis, and psychological profiling. However, these methods failed to yield any concrete leads, as the perpetrator's DNA had no match in national or international databases.

The introduction of forensic genetic genealogy marked a turning point. Forensic genetic genealogy (FGG) begins with genotyping a forensic or reference sample in a vendor lab, generating an FGG profile. This profile is uploaded to public personal genomics databases (e.g., Ancestry, FamilyTreeDNA, MyHeritage, 23andMe) containing extensive SNP microarray data. Relative matching services, like FamilyTreeDNA and GEDmatch, rank genetic relatives based on shared centimorgans (cM). Genetic genealogists analyze these matches to construct family trees, identifying potential relatives and refining investigative leads. Investigators uploaded the crime scene DNA to GEDmatch, a public genealogy database, allowing them to trace distant relatives. Using genealogical mapping and genotype imputation, they reconstructed family trees to pinpoint the suspect's lineage.

The Linköping double murder case utilized multiple investigative methods, which can be categorized as follows:

A. Bloodstain Pattern Analysis

Blood spatter analysis provided crucial insights into the sequence of events during the attack. Experts examined blood droplet distribution and impact angles to determine movement patterns. The analysis confirmed rapid and forceful stabbing motions, supporting eyewitness accounts. The positioning of blood stains helped establish the attack trajectory.

B. Trace Evidence Examination

Trace evidence, including fibers and hair samples, contributed to physical profiling. A knitted cap recovered from the scene contained blond hair strands. Microscopic analysis confirmed the presence of tobacco and snus residues, indicating the suspect's smoking habits. Comparative forensic analysis aligned hair morphology with predicted phenotypic characteristics.

C. DNA Profiling and STR Analysis

DNA profiling is a cornerstone of forensic identification. During the forensic study of the butterfly knife, police technicians and scientists from the National Laboratory of Forensic Science (SKL), the forerunner of today's NFC, found DNA evidence from three individuals[10]. In this case, short tandem repeat (STR) analysis was performed on biological evidence collected from the crime scene. STR profiling focuses on repetitive sequences in the human genome, enabling individual identification with high accuracy. The DNA obtained from the murder weapon and knitted cap underwent STR profiling. The DNA sample included DNA from both victims and an unknown individual. The discovery of the unknown person's DNA on confiscated objects highlights the relevance of the trail. During the pilot instance, the unknown person's DNA profile was compared to the national DNA database and European states via the Prüm Treaty[11]. In the case, a thorough DNA-sampling of more than 6000 individuals was tested out throughout the years (testing of chosen participants was also continuing during the investigation)[12]. No matches were found in Sweden's national database or international forensic records. Investigators then pursued advanced genetic techniques for suspect identification.

D. Biogeographical Ancestry Analysis

Multi-dimensional scaling MDS analysis of 24 ancestry-informative autosomal SNPs and four global reference populations revealed the perpetrator's biogeographical origin in Western Eurasia. The HIrisPlex system was used to examine Y- and mtDNA-SNPs, as well as estimate hair and eye colour[13]. Multi-dimensional scaling (MDS) analysis of ancestry-informative SNPs suggested a Western Eurasian origin. Y-chromosome and mitochondrial DNA (mtDNA) markers further reinforced European descent. Phenotypic predictions from DNA suggested blond hair, aligning with witness descriptions.

E. Role of forensic genetic genealogy

Genetic genealogy, often known as investigative genetic genealogy (IGG) or forensic genealogy, is a powerful tool for identifying unknown offenders and human remains[14](**Figure 1**). IGG

[10] Andreas Tillmar and others, 'Getting the Conclusive Lead with Investigative Genetic Genealogy–A Successful Case Study of a 16 Year Old Double Murder in Sweden' (2021) 53 Forensic science international: genetics 102525.

[11] ibid.

[12] 'Genealogy and DNA Help Solve 16-Year-Old Double-Murder Case in Sweden' *The Nomad Today* (2023) <https://www.thenomadtoday.com/articulo/world/genealogy-helps-solve-16-year-old-double-murder-case-in-sweden/20200903111615007751.html>.

[13] ibid.

[14] Claire L Glynn, 'Bridging Disciplines to Form a New One: The Emergence of Forensic Genetic Genealogy' (2022) 13 Genes 1381.

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

involves utilising large genotype data sets, such as hundreds of thousands of SNPs, in combination with public genealogical DNA databases to identify biological relatives of unknown donors by comparing common DNA segments[15]. The main key components is that just a percentage of the population of interest must be included in the database to be able to identify every individual in the population using the method of genetic genealogy. If 1% of the population of interest is in the genealogy DNA database, there is a greater than 90% chance of identifying a third cousin for each individual[16] . DNA typing with microarrays is an affordable, easy, and quick technology for determining the genotypes needed for investigation[17]. However, the procedure of microarrays normally needs larger amounts of DNA (in the order of hundreds of nanograms)[18].

After the successful use of IGG to apprehend the "Golden State Killer" was reported in Swedish media, the Swedish Police Authority was asked if this tool might also be employed by Swedish law enforcement[19]. In May 2018, the National Forensic Centre (NFC) launched a legal investigation into the usage of IGG in Sweden, which was developed in collaboration with the Legal Affairs Department within the Police Authority[20]. The legal investigation was completed in January 2019 and included a recommended procedure, case inclusion criteria, legal issues, and a methodology framework. Microarrays have been used for IGG applications, but advances in DNA sequencing technology have made it possible to handle damaged DNA in small quantities[21].

If the already existing SNP data set lacks observable genotypes for a high fraction of the SNPs, missing genotypes can be imputed using procedures known as genotype imputation[22]. The primary goal of genotyping imputation is to estimate genotypes for SNPs not typed in the sample of interest[23]. The main perspective is that any two individuals, even those who appear unrelated, might share tiny portions of DNA from a distant common ancestor. Such DNA segments are shared identity by descent (IBD). Aspects like high levels of linkage disequilibrium (LD) and low recombination rates within minor stretches of chromosomal segments will preserve haplotype variants throughout the generations[24]. To identify shared DNA segments, compare detected genetic variations in a sample to alternatives from a panel of reference individuals, such as the 1000 Genomes Project[25]. Based on the discovered genetic variations in the reference people, it is possible to forecast the missing genotypes in the sample using these common segments. Statistical models, including Hidden Markov Models (HMMs) and Expectation-Maximization (EM) algorithms, inferred missing SNPs. This technique refined kinship analysis, allowing investigators to establish a genetic link to the perpetrator. A variety of software is available, and several research have been undertaken to investigate the performance and accuracy of genotyping imputation[26].

In 2020, a significant breakthrough occurred when investigators utilised the novel method of forensic genetic genealogy to solve the case. Genetic genealogist Peter Sjölund played a vital part in tracking the DNA evidence collected at the crime site to a family tree. Ancestral DNA tracking led to the arrest of Daniel Nyqvist, 37, and his elder brother, who had lived in

[15] Daniel Kling and others, 'Investigative Genetic Genealogy: Current Methods, Knowledge and Practice' (2021) 52 Forensic Science International: Genetics 102474.
[16] Yaniv Erlich and others, 'Identity Inference of Genomic Data Using Long-Range Familial Searches' (2018) 362 Science 690.
[17] Javier Garaizar, Aitor Rementeria and Steffen Porwollik, 'DNA Microarray Technology: A New Tool for the Epidemiological Typing of Bacterial Pathogens?' (2006) 47 FEMS Immunology & Medical Microbiology 178.
[18] Ankita Patel and Sau W Cheung, 'Application of DNA Microarray to Clinical Diagnostics' [2016] Microarray Technology: Methods and Applications 111.
[19] Christi J Guerrini and others, 'IGG in the Trenches: Results of an in-Depth Interview Study on the Practice, Politics, and Future of Investigative Genetic Genealogy' (2024) 356 Forensic science international 111946.
[20] Tillmar and others (n 4).
[21] Vigdis Nygaard and Eivind Hovig, 'Options Available for Profiling Small Samples: A Review of Sample Amplification Technology When Combined with Microarray Profiling' (2006) 34 Nucleic acids research 996.
[22] Michael Nothnagel and others, 'A Comprehensive Evaluation of SNP Genotype Imputation' (2009) 125 Human genetics 163.
[23] ibid.
[24] Tillmar and others (n 4).
[25] 1000 Genomes Project Consortium, 'A Global Reference for Human Genetic Variation' (2015) 526 Nature 68.
[26] Shuo Shi and others, 'Comprehensive Assessment of Genotype Imputation Performance' (2019) 83 Human Heredity 107.

NFSU JOURNAL OF FORENSIC JUSTICE

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

Ostergotland for their whole lives[27]. The police first apprehended Daniel's brother, who did not fit the description provided by one of the witnesses before to her murder.

At this point, the authorities were pleased that the second brother had committed the homicide, so they captured Daniel from his residence in Johannelund on Tuesday morning, June 9, 2020, at approximately 06:35 AM. As expected, his DNA matched the suspect's description exactly.

This procedure entailed submitting the crime scene DNA to GEDmatch, a public genealogy database, and then utilising family matches to limit down the list of potential suspects. Nyqvist was finally identified and arrested in June 2020, with his DNA indicating a 100% match with the crime scene evidence.[28].

F. Recent Advances in Forensic Genetic Genealogy

Advancements like Massive Parallel Sequencing (MPS) and Whole Genome Sequencing (WGS) have transformed DNA profiling. MPS enables rapid analysis of degraded or low-quantity DNA samples, offering detailed contributor estimates. WGS, utilized by projects like the DNA Doe Project, generates SNP datasets for genealogy databases, aiding in the identification of unknown individuals. Forensic DNA phenotyping (FDP) predicts physical traits like hair and eye color, assisting investigations. Despite challenges in cost, availability, and privacy (especially in Europe), FDP and other technologies enhance the resolution of cold cases and open new avenues in active investigations. AI tools optimize genetic analyses, streamline DNA sample classification, and automate STR profile interpretation to reduce human error. This integration accelerates DNA matching, enabling quicker identification of individuals and enhancing forensic investigation reliability.

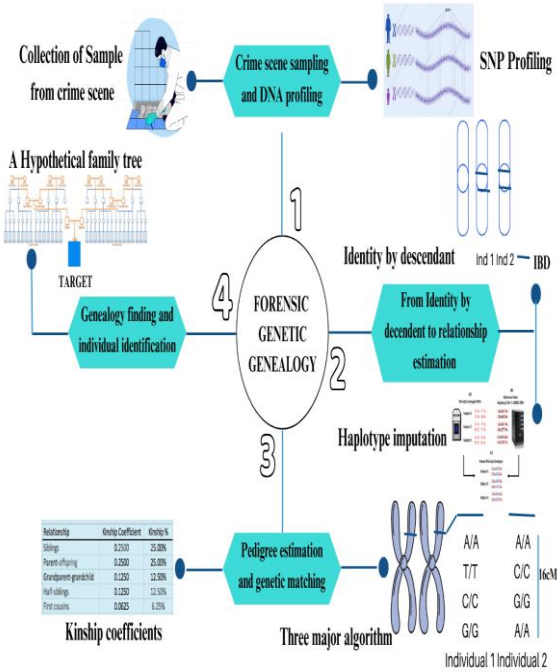

Figure 1:- Workflow of Forensic Genetic Genealogy. The diagram highlights the Forensic Genetic Genealogy workflow for the Investigative agencies.

IV. COURT TRIAL AND THE VERDICT

He confessed to the killings without hesitation, and the most stunning aspect of Daniel's arrest was that he did not try to lie to the authorities or disguise his crimes[29]. He initially stabbed Muhammad Ammouri. When Anna-Lena witnessed the murder, he attacked her, stabbing her to death. He indicated that he had been disturbed by obsessive thoughts and believed that murdering two persons would bring serenity[30]. During the trial, two of Daniel's boyhood pals testified that they saw a significant shift in his demeanour and behaviour in the early 2000s[31]. Daniel, a Folkungaskolan alumni, chose to drop out of high school to start again at a new school where no one recognised him. Daniel's former pals noted that he no longer appeared to be joyful and was attempting to blend in with the throng. Daniel, who had never drank alcohol or any other risky

[27] 'Genealogist Uses Ancestry Website to Track down Knife Killer' *THE SUNDAY TIMES* (2020) <https://www.thetimes.com/world/article/genealogist-uses-ancestry-website-to-track-down-knife-killer-m60rs0j2l?region=global>.

[28] 'How Swedish Police Tracked down Double Murder Suspect after 16 Years' *THE LOCAL se* (2020) <https://www.thelocal.se/20200609/how-swedish-police-tracked-down-double-murder-suspect-after-16-years-linkoping>.

[29] 'Suspect Confesses to 2004 Double Murder' *sverigesradio* (2020) <https://www.sverigesradio.se/artikel/7491455>.

[30] '37-Årig Man Döms För Dubbelmord i Linköping 2004' (2020) <https://www.dn.se/sverige/nu-faller-dom-efter-dubbelmordet-i-linkoping-2004/>.

[31] 'Real-Life David Nilsson In "The Breakthrough": Where Is Linkoping Double Murder Killer Now?' *DMT* (2025) <https://dmtalkies.com/real-life-david-nilsson-in-the-breakthrough-2025/>.

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

substance, spent much of his time in his room drinking beer. He isolated himself from his friends and family. They tried to talk reason into him, but it was futile. Talking to Daniel felt like speaking to a wall. During the investigation, Henry Jansen, the principal investigator, obtained information from one of Daniel's childhood pals about his peculiar interest in knives. Henry summoned Daniel to a police interrogation, but he did not show up.

His psychological disability was deemed critical to understanding his actions. For perpetrating the crime, he was sentenced to indefinite mental treatment in 2020, because it was judged that he had no control over his urge at the moment of this awful conduct[32]. He was also ordered to pay 350,000 SEK to the relatives of the deceased 8-year-old and 1.4 million SEK to the Swedish government. Anna-Lena's family did not requested any compensation throughout the trial[33].

A. *Mental Illness of Daniel Nyqvist*

Daniel's mother requested that he undergo a forensic mental assessment after seeing that his condition had deteriorated in 2011. According to sources, Daniel was diagnosed with Asperger syndrome[34]. In layman's words, it is a mental condition that prevents an affected person from socialising and communicating. This explains why Daniel isolated himself and spent more time in his room. Daniel's brother reported that he has always struggled with expressing emotions and understanding others' feelings[35]. Daniel's sibling had already moved out of his parents' house when the double murder happened in 2004, leaving no one to genuinely care for Daniel or identify his deteriorating mental health. He stopped coming out of his room and began hearing voices in his head, which he never told anybody, maybe because no one questioned what was wrong with him.

Daniel's parents and sister were unaware of his mental impairment until it was too late for him to receive immediate assistance. Johan Ritzer, Daniel's designated lawyer and public defender, said that he was not a psychopath. He had a major mental disorder that had gone untreated for a lengthy period. He also stated that he would not appeal his sentence[36].

V. CONCLUSION

The Linköping double murder case exemplifies how technical improvements and novel investigation tactics may revive cold cases. This case, which shocked and saddened the town of Linköping, shows law enforcement and forensic experts' unwavering pursuit of justice. For 16 years, the murders of Mohammad Ammouri and Anna-Lena Svensson remained unexplained, despite investigators using standard forensic procedures. The adoption of forensic genetic genealogy constituted a watershed moment in the inquiry. This novel strategy allowed researchers to overcome the constraints of traditional DNA databases by combining genealogy research with public DNA databases. The thorough effort of genetic genealogist Peter Sjölund, along with the resolve of the Swedish police, resulted in Daniel Nyqvist's identification and arrest. His later confession and conviction demonstrated the validity and effectiveness of forensic genetic genealogy. The effective conclusion of the Linköping double murder case emphasises the use of forensic genetic genealogy and the need of incorporating modern technology and procedures into criminal investigations. It emphasises genetic genealogy's ability to solve problems that were previously thought to be intractable. The case demonstrates the effectiveness of coordination among forensic scientists, genealogists, and law enforcement organisations. Investigators were able to reach a breakthrough that had previously evaded them for almost a decade by merging expertise from many sectors. The detectives' relentless determination to solve the case, despite multiple hurdles and delays, demonstrates their commitment to justice. It emphasises the value of perseverance in the face of hardship. As forensic genetic genealogy advances, it gives promise for resolving more cold cases, bringing victims justice and offering closure to their families. The Linköping double murder case not only delivered justice to Mohammad Ammouri and Anna-Lena Svensson, but it also laid the path for future advances in forensic examination.

VI. REFERENCES

[1] '5 Key Details about Mohammed Ammouri and Anna-Lena Svensson's Murder: Details

[32] 'Swede Convicted of Double Murder after DNA Match 16 Years Later' *THE LOCAL se* (2020) <https://www.thelocal.se/20201001/swede-convicted-of-double-murder-after-dna-match-16-years-later>.

[33] ibid.

[34] 'Real-Life David Nilsson In "The Breakthrough": Where Is Linkoping Double Murder Killer Now?' (n 31).

[35] ibid.

[36] 'Genealogy and DNA Help Solve 16-Year-Old Double-Murder Case in Sweden' (n 8).

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

Explored as Netflix Drops The Breakthrough' *Sportskeeda* (2025) <https://www.sportskeeda.com/us/shows/5-key-details-mohammed-ammouri-anna-lena-svensson-s-murder-details-explored-netflix-drops-the-breakthrough>

[2] '37-Årig Man Döms För Dubbelmord i Linköping 2004' (2020) <https://www.dn.se/sverige/nu-faller-dom-efter-dubbelmordet-i-linkoping-2004/>

[3] 1000 Genomes Project Consortium, 'A Global Reference for Human Genetic Variation' (2015) 526 Nature 68

[4] 'Åh Nej, Sidan Kunde Inte Hittas' <https://polisen.se/Ostergotland/Aktuellt/Pressmeddelanden/Ostergotland/Polisen-behover-hjalp-med-att-identifiera-en-man>

[5] Dery III GM, 'Can a Distant Relative Allow the Government Access to Your DNA: The Fourth Amendment Implications of Law Enforcement's Genealogical Search for the Golden State Killer and Other Genetic Genealogy Investigations' (2019) 10 Hastings Sci. & Tech. LJ 103

[6] 'Dubbelmordet i Linköping: 37-Åringen Döms För Mord till Rättspsykiatrisk Vård' *SVT Nyheter* (2020) <https://www.svt.se/nyheter/lokalt/ost/efter-16-ar-nu-faller-domen-i-dubbelmordet>

[7] 'Dubbelmordet i Linköping Tas Upp i Nytt Tv-Program' (2010) <https://www.nt.se/nyheter/linkoping-/artikel/dubbelmordet-i-linkoping-tas-upp-i-nytt-tv-program/rkwn8qvr>

[8] Erlich Y and others, 'Identity Inference of Genomic Data Using Long-Range Familial Searches' (2018) 362 Science 690

[9] Garaizar J, Rementeria A and Porwollik S, 'DNA Microarray Technology: A New Tool for the Epidemiological Typing of Bacterial Pathogens?' (2006) 47 FEMS Immunology & Medical Microbiology 178

[10] 'Genealogist Uses Ancestry Website to Track down Knife Killer' *THE SUNDAY TIMES* (2020) <https://www.thetimes.com/world/article/genealogist-uses-ancestry-website-to-track-down-knife-killer-m60rs0j2l?region=global>

[11] 'Genealogy and DNA Help Solve 16-Year-Old Double-Murder Case in Sweden' *The Nomad Today* (2023) <https://www.thenomadtoday.com/articulo/world/genealogy-helps-solve-16-year-old-double-murder-case-in-sweden/20200903111615007751.html>

[12] Glynn CL, 'Bridging Disciplines to Form a New One: The Emergence of Forensic Genetic Genealogy' (2022) 13 Genes 1381

[13] Guerrini CJ and others, 'IGG in the Trenches: Results of an in-Depth Interview Study on the Practice, Politics, and Future of Investigative Genetic Genealogy' (2024) 356 Forensic science international 111946

[14] 'How Swedish Police Tracked down Double Murder Suspect after 16 Years' *THE LOCAL se* (2020) <https://www.thelocal.se/20200609/how-swedish-police-tracked-down-double-murder-suspect-after-16-years-linkoping>

[15] Kling D and others, 'Investigative Genetic Genealogy: Current Methods, Knowledge and Practice' (2021) 52 Forensic Science International: Genetics 102474

[16] 'Linköping Double Murder Case Trial to Take Place Later This Month' <https://www.sverigesradio.se/artikel/7544800>

[17] 'Man on Trial for Murder after DNA Hit on Genealogy' *RTE News* (2020) <https://www.rte.ie/news/world/2020/0915/1165379-sweden-dna-trial/>

[18] Nothnagel M and others, 'A Comprehensive Evaluation of SNP Genotype Imputation' (2009) 125 Human genetics 163

[19] Nygaard V and Hovig E, 'Options Available for Profiling Small Samples: A Review of Sample Amplification Technology When Combined with Microarray Profiling' (2006) 34 Nucleic acids research 996

[20] Patel A and Cheung SW, 'Application of DNA Microarray to Clinical Diagnostics' [2016] Microarray Technology: Methods and Applications 111

[21] 'Real-Life David Nilsson In "The Breakthrough": Where Is Linkoping Double Murder Killer Now?' *DMT* (2025) <https://dmtalkies.com/real-life-david-nilsson-in-the-breakthrough-2025/>

[22] Shi S and others, 'Comprehensive Assessment of Genotype Imputation Performance' (2019) 83 Human Heredity 107

[23] 'Suspect Confesses to 2004 Double Murder' *sverigesradio* (2020) <https://www.sverigesradio.se/artikel/7491455>

[24] 'Swede Convicted of Double Murder after DNA Match 16 Years Later' *THE LOCAL se* (2020) <https://www.thelocal.se/20201001/swed

JFJ
Volume: 3, Issue: 2
July-December 2024
E-ISSN: 2584 - 0924

e-convicted-of-double-murder-after-dna-match-16-years-later>

[25] 'Sweden: Man Goes on Trial for 2004 Murder after DNA Matched to Genealogy Site' *The Guardian* (2020) <https://www.theguardian.com/world/2020/sep/15/man-on-trial-in-sweden-for-double-murder-after-15-year-dna-wait>

[26] Tillmar A and others, 'Getting the Conclusive Lead with Investigative Genetic Genealogy–A Successful Case Study of a 16 Year Old Double Murder in Sweden' (2021) 53 Forensic science international: genetics 102525