

Parabon Tops 200 Solved Cases

Buoyed by technological advancements, Parabon's Snapshot® team reports 67 IDs in 2021

(additional statistics provided in accompanying image)

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On December 6, 2021, detectives from the Charlotte-Mecklenberg Police Department (CMPD) announced that they had identified David Edward Doran as the “Myers Park Rapist,” responsible for committing at least 15 sexual assaults of young girls in North Carolina between 1990 and 1999. The case marked the 200th time that a lead from the [Snapshot DNA](#) analysis division at Parabon NanoLabs resulted in a positive identification since Parabon began offering investigative genetic genealogy services to law enforcement in May 2018.



Parabon’s technologies have had an astounding impact on investigations, allowing more than 200 to be resolved in only three and a half years. It’s truly changing the face of cold case investigations.”

Detective Brian Martin

Throughout 2021, Parabon learned of 66 more cases that were solved with assistance from the company’s unique combination of DNA phenotyping, kinship testing, and investigative genetic genealogy. Since introducing investigative genetic genealogy (IGG), Parabon has assisted law enforcement in making a positive identification (perpetrator or unidentified decedent) at the astonishing rate of more than one per week on cases that, on average, have been cold for over 25 years. When added together, these cases represent more than 5,000 years of investigation that have been closed.

Parabon’s coldest case of 2021 was the identification of 2-year-old Steven “Stevie” Crawford, whose decomposed remains were discovered by a fisherman in the Keen County Reservoir, OR,

Parabon Snapshot by the Numbers

	In 2021	Overall
Total number of leads resulting in identifications* (IDs) since Parabon started offering GG (May 2018) (across all Parabon Snapshot services)	67	202
Number of those identifications that used whole-genome sequencing (WGS)	21	21
Lowest WGS genome coverage resulting in an ID	0.63X	0.63X
Lowest WGS pre-enrichment alignment rate* resulting in an ID	3.79%	3.79%
Most distant top match resulting in an ID	30.1 cM	30.1 cM
Average number of IDs per week since May 2018	1.29	1.06
Years of investigation closed*	1,623.0	5,126.4
“Coldest” sample identified	58 years old	90 years old
“Hottest” sample identified	9 months old	3 weeks old

* DNA samples where Parabon provided a lead through one or more Snapshot analyses and led the agency to an individual whose identity was confirmed. Services used include investigative genetic genealogy, DNA phenotyping, ancestry determination and/or kinship inference. Includes cases analyzed in 2019 and 2020 where Parabon was notified of the solve in 2021. Does not include Snapshot identifications from prior to May 2018.

^ Proportion of a DNA sample that aligns to the human genome and therefore is likely human.

* Years between date of crime and date of ID, summed over all IDs

Snapshot DNA Analysis Service Metrics

on 7/11/1963 and identified 58 years later. One of Parabon's most recent cases was the positive identification of 9-year-old murder victim Haley Mae Coblentz, whose body was found stuffed in a duffel bag in the woods in Lincoln County, OR on 12/10/2020. Her mother, Shawna Browning, and the mother's girlfriend, Lauren Harrison, have been charged with aggravated murder.

Technological advances were crucial in making 2021 such a successful year. For the first time in Parabon's history, 21 of the identifications were accomplished using whole genome sequencing (WGS). "WGS has proven crucial for analyzing challenging DNA samples, particularly from bone, where the DNA is often highly fragmented and mixed with DNA from the environment," said Dr. Janet Cady, Parabon's Senior Bioinformatics Scientist who leads the company's WGS efforts. Advancements on the laboratory side, such as the enrichment for DNA fragments matching the human genome, allowed for cases to be solved even when the pre-enrichment alignment rate was

less than 10% (i.e., more than 90% of the DNA in the sample was from microbial contamination). Advancements on the bioinformatics side, such as low-coverage imputation, allowed for cases to be solved even when the sequencing coverage was below 1X (i.e., each spot in the human genome was sequenced less than one time on average). These technological advances were shared with the forensic community in November, when Parabon published an article about the technical, analytical, and policy changes that have taken place in the IGG landscape over the past two years(1), since Parabon first published a comprehensive article on the topic in 2019.(2)

In addition to WGS, advancements were made in IGG techniques that allowed the Parabon team to solve a case with the most distant top match ever reported, 30.1 centimorgans (cM). With this distant lead, an intensive collaboration with dedicated Morris County detectives led to the positive identification of Bruce Cymanski, who allegedly sexually assaulted and killed 17 year-old

Snapshot Prediction Results Composite Profile
#1CSO-OR-77-6636-Snapshot

Predicted () & Excluded (X) Phenotypes

Sex:	Male
Age:	Unknown (Shown at age 23)
Body Mass:	Unknown (Shown at BMI 22)
Ancestry:	North and/or Northeast European

Skin Color: 4.6 (Fair / Very Fair (90.4% confidence))
 NOT Lt. Brown / Brown / Dk. Brown (90.4% confidence)

Eye Color: 10.7 (Blue / Green (91.4% confidence))
 NOT Hazel / Brown / Black (91.4% confidence)

Hair Color: 9.0 (Blond (97.6% confidence))
 NOT Lt. Brown / Black (97.6% confidence)

Freckles: 86.9 (Few / Some (29.2% confidence))
 NOT Zero (91.3% confidence)

Snapshot Prediction Results Composite Profile
#22ndMP-WA-0155-87-CID056-31103

Predicted () & Excluded (X) Phenotypes

Sex:	Male
Age:	Unknown (Age progressed to ~50-55 years)
Body Mass:	Unknown (Shown at BMI 22, Normal)
Ancestry:	North and/or Northeast European

Skin Color: 4.7 (Fair / Very Fair (88.6% confidence))
 NOT Brown / Dk. Brown (99.9% confidence)

Eye Color: 71.4 (Hazel / Green (88.3% confidence))
 NOT Blue / Black (96.7% confidence)

Hair Color: 90.0 (Brown / Black (94.7% confidence))
 NOT Blond (94.7% confidence)

Freckles: 73.0 (Few / Some (25.0% confidence))
 NOT Zero (97.6% confidence)

Profiles. See footnote 3 for case information.

(L) CeCe Moore, Chief Genetic Genealogist - (M) Ellen Greytak, PhD, Director of Bioinformatics - (R) Janet Cady, PhD, Sr. Bioinformatics Scientist

Nancy Noga on 1/7/1999 in Sayreville, NJ.

“It is exciting and gratifying to see my long-held, unwavering belief in the power of investigative genetic genealogy fulfilled in such an impactful way,” said CeCe Moore, Parabon’s Chief Genetic Genealogist. She continued, “We are grateful for the detectives who never gave up on these cases and enthusiastically embraced a new technology. Without their tireless efforts and dedication, none of this would be possible.”

Parabon’s leads resulted in multiple successful prosecutions in 2021. On May 6, 2021, Thomas Lewis Garner was found guilty by a jury in Sanford County FL for the 1976 murder of Naval Seaman Pamela Cahanes. Garner had been identified as the suspect through Snapshot DNA Phenotyping, IGG analysis and Kinship testing in 2019. On June 24, 2021, Michael Whyte was found guilty by a jury in Colorado Springs, CO for the 1987 murder of US Army soldier Darlene Krashoc. Whyte had been identified as the suspect through IGG analysis and Snapshot DNA Phenotyping in 2019. Finally, on July 27, 2021, Raymond L. Vannieuwenhoven was found guilty by a jury in Marinette, WI for the 1984 murder of Ellen Matheys and David Schuldes. Vannieuwenhoven had been identified as the suspect through Snapshot DNA Phenotyping and IGG analysis in 2019. Additionally, several individuals identified from Parabon leads pled guilty in 2021.

“A cold case detective can spend their entire career hoping to finally close one of these decades-old cases. Parabon’s technologies have had an astounding impact on these investigations, allowing more than 200 to be resolved in only three and a half years. It’s truly changing the face of cold case investigations,” said Detective Brian Martin of the Fort Wayne Indiana Police Department.

---Footnotes---

(1) <https://promega.foleon.com/theishireport/the-ishi-report-november-2021/genetic-genealogy-for-cold-case-and-active-investigations-2021-update/>

(2) In 2019, approximately one year after IGG burst into the public eye, the Parabon team published a comprehensive paper on the current state of the art for IGG.
https://www.researchgate.net/publication/332047092_Genetic_genealogy_for_cold_case_and_active_investigations

(3) Image caption: Side-by-side comparison of Snapshot® DNA Phenotype prediction composite profiles and photos of the perpetrators who were later identified.

Left: Ronald Shroy, identified as the killer of Eric Goldstrand, 17, and Lliana Adank, 16, in Oregon in 1977.

Right: Michael Whyte, convicted of killing 20-year-old Army Spc. Darlene Krashoc in Colorado in 1987.

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