Parabon Sees Trend in Active Casework Use of Investigative Genetic Genealogy (IGG)

Could IGG Make the Term "Cold Case" Obsolete?

RESTON, VIRGINIA, UNITED STATES, February 15, 2023 /EINPresswire.com/ -- Whether the motivation for the crime was love, lust, looting or loathing, Parabon's investigative genetic genealogy (IGG) service has transformed the way violent criminal cases are investigated. To date, Parabon's Snapshot® Advanced DNA Analysis Services ("Snapshot") (1), which includes IGG, has helped law enforcement agencies throughout the United States and Canada make positive identifications in over 260 cases — averaging approximately one per week since the IGG service was first offered in May 2018. Parabon's annual casework update for 2022 is provided in Table 1.

> "There is no longer any reason for violent criminal cases with DNA evidence to go cold. I'd like to think we can help make the term "cold case" eventually become obsolete."
>
> *CeCe Moore, Parabon's Chief Genetic Genealogist*

Beginning in 2018, law enforcement agencies throughout the United States and Canada have routinely made announcements about decades-old cold cases being resolved with a lead generated by Parabon. During this same time, IGG advocates and journalists throughout the world speculated that IGG would also change the landscape of active criminal investigations - and they were right. When asked about the landscape today, Parabon's Chief Genetic Genealogist, CeCe Moore said "The evidence is indisputable. There is no longer any reason for violent criminal cases with DNA evidence to go cold."

The very first active investigation to use IGG, was a 2018 sexual assault case of an elderly woman in St. George, Utah that occurred only three weeks prior to Parabon becoming involved in the case (2). The crime was committed in April and the agency sent the DNA sample to Parabon in May. By July the police had finished its investigation into the leads provided by Parabon, matched the crime scene DNA to the person-of-interest, arrested him and obtained a confession. The offender entered a plea deal and was sentenced to serve a minimum of six years in the Utah State Prison where he is currently carrying out his sentence. This was the first time that a suspect identified through IGG in an active investigation was identified and convicted of a crime. "The St. George case is a good example of how extremely powerful investigative genetic genealogy can be and the significant impact it can have on improving public safety by stopping would-be serial offenders in their tracks and saving lives, as well as conserving public

resources." Moore stated. Since that time, Parabon has helped close 15 additional active investigations (3), including one where the DNA sample was received by Parabon only three days after the crime was committed.

"Because Parabon's Snapshot division has been so successful in helping law enforcement agencies solve hundreds of cold cases, agencies are now turning to us regularly for active investigations, so that cases don't go cold in the first place." said Ellen Greytak, PhD, Parabon's Director of Bioinformatics and the Snapshot Division Technical Leader. In addition to using IGG for the first time on an active criminal investigation, Moore's work at Parabon has led to the first conviction, the first conviction through jury verdict, and the first exoneration in cases where the suspect was identified through IGG. Parabon and its customers also made the first identification of a violent offender in Canada via a lead generated through IGG in 2018. Prior to offering IGG, Parabon used its Snapshot DNA phenotyping and kinship inference technologies for lead generation purposes, and those technologies resulted in several additional identifications and convictions.

Parabon Snapshot Statistics Since May 2018

Total number of leads resulting in identifications[1] (IDs) since Parabon started offering GG (May 2018) across all Parabon Snapshot services	261
Number of those IDs that used whole-genome sequencing (WGS)	46
Number of those IDs that used microarray genotyping (half the price of WGS)	215
Number of identifications that required bioinformatics expertise (imputation, data repair, or mixture deconvolution)	70
Touch DNA samples successfully analyzed	43
Number of identifications in cases <5 years old	35
Number of identifications in cases >30 years old	105
Active cases resulting in an ID (DNA received within 6 months of crime)	16
Most active investigation resulting in an ID (date of crime to DNA receipt)	3 days old
Number of convictions (jury and plea deals)	57
Number of perpetrators who were deceased at time of ID	43
Lowest quantity of DNA successfully analyzed	0.114 ng
Lowest human genome coverage[2] resulting in an ID	0.63X
Smallest proportion of human DNA in a sample[3] resulting in an ID	3.79%
Most distant top match resulting in an ID	30.1 cM
Average number of IDs per week since May 2018	1.06
Years of investigation closed[4]	6,594.9
Oldest sample uploaded for GG analysis	Early 1800s
Oldest DNA data analyzed	>2,500 years

[1] 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 previous years where Parabon was notified of the solve in 2022. Does not include Snapshot identifications from prior to May 2018.
[2] Average number of times each site in the human genome (~3.1 billion) is covered by a sequencing read, e.g. 10X coverage = 31 billion sites sequenced. Most sequencing aims to sequence to ~30X coverage, but forensic samples typically yield coverage <5X. However, even below 1X, sufficiently high-quality data has been produced by Parabon's bioinformatics team to result in an ID.
[3] Proportion of a DNA sample that aligns to the human genome and therefore is likely human. WGS sequences all DNA in a sample, so large amounts of non-human DNA can reduce human genome coverage. Specific laboratory and bioinformatic methods are required to obtain high-quality data from such samples.
[4] Years between date of crime and date of ID, summed over all IDs

Table 1: Parabon Snapshot Statistics Since May 2018

Out of the hundreds of cases with positive identifications, over 130 involved living violent offenders. Many of those cases are still going through the prosecution process, but so far 57 have resulted in conviction. Many of the convictions are from plea deals, but 19 convictions were obtained via bench/jury trial. "It might seem ambitious, but I'd like to think we can help make the term "cold case" eventually become obsolete", said Moore.

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(1) The Snapshot division consists of IGG and other services that are complementary to IGG that either enable or inform the IGG work, including specialized DNA processing, such as whole genome sequencing and genotyping, advanced bioinformatics, DNA phenotyping (i.e., trait prediction) and kinship inference.

(2) https://abc.com/shows/the-genetic-detective/episode-guide/season-01/06-the-hot-case

(3) In this context an active investigation is defined as DNA received by Parabon within 6 months of the crime.

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