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How genetic genealogy helped solve the 1984 murder of 18-year-old Traci Hammerberg

Jeff Rumage Milwaukee Journal Sentinel

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For more than three decades, the unsolved murder of 18-year-old Traci Hammerberg nagged at detectives in the Ozaukee County Sheriff's Office.

Despite their best efforts, the detectives were never able to find justice for Hammerberg, who was found half-naked in a town of Grafton driveway in December 1984.

Then, in April 2018, they learned that California authorities had, after 42 years, identified Joseph James DeAngelo as the Golden State Killer, who police believe committed about 12 murders and 45 rapes in the 1970s and 1980s.

Police in California had cracked the cold case using DNA evidence and genealogy databases.

The case caught the attention of Ozaukee County Sheriff Jim Johnson and state Department of Criminal Investigations agent Neil McGrath, who had been searching for answers in the Hammerberg case since 2005.

They contacted the Wisconsin State Crime Lab to see whether forensic genetic genealogy could help solve Traci Hammerberg's case, but that approach to forensic science has not yet been implemented here in Wisconsin.

They also reached out to several private labs, but had no luck. Eventually, McGrath decided to call the FBI Bureau in Los Angeles that helped solve the Golden State Killer case.

It was a roll of the dice, but it paid off.

Help from afar

In March 2019, the Los Angeles Forensic Genetic Genealogy team took on the case, with assistance from Barbara Rae-Venter, an acclaimed genetic genealogy consultant.

Investigators had used most of the DNA evidence from the Hammerberg murder scene on other forensic tests, but there was still some DNA left on a piece of evidence. The DNA was sent to a private lab, which created a DNA profile. That profile was uploaded to a genealogy database, similar to those used by Ancestry.com and other genetic testing companies.

The genealogy database was able to compare the DNA profile of the suspect with a large network of genetic profiles, and then measure the similarity of those DNA profiles through a measurement called centiMorgans.

The number of centiMorgans indicates how closely the person in the database is related to the DNA sample collected from the murder scene. For example, a parent and child will share about 3,400 centiMorgans, whereas a first cousin or a great-grandparent will share about 850 centiMorgans, according to the International Society of Genetic Genealogy Wiki website.

Building a genetic family tree

In the Hammerberg case, the centiMorgan score of the closest database match indicated it was a second-cousin of the suspect. That meant investigators needed to work backward to find that second cousin.

But doing so would not be easy.

Because the relative was fairly distant, investigators had to develop a family tree spanning four generations to identify anyone who could have been a second cousin to the suspect.

Investigators built the family tree using public records, obituaries, police records and ancestry websites. Then, they verified their findings with a computer software program.

Johnson said he doesn't remember exactly how many names were in the extended family tree — but it was "a lot."

"There were some long nights," Johnson said.

Narrowing the search

Once they had a list of second cousins, they narrowed their suspect list by focusing on males that would have been between 16 and 60 years old in 1984. Then, police worked on

eliminating suspects through traditional investigative methods.

Some of the suspect's relatives volunteered their DNA to help police confirm they were on the right path.

After five months of work, police eventually narrowed their sights on Philip Cross — a name that had never been mentioned in the past 34 years of investigation.

"We had contact with him over the years, but nothing related to Traci Hammerberg," Johnson said. "No friends or relatives had brought him up."

Zeroing in

With further digging, investigators learned that Cross worked second shift at Rexnord Plastics in Grafton, so he could have encountered Hammerberg as she walked along Highway 33 on his drive home to Port Washington that night.

She is thought to have left a party in Port Washington at about 12:30 a.m., walking toward her Saukville home nearly 4 miles away.

Investigators also learned that Cross had many run-ins with the law for violence, angry outbursts and drug and alcohol issues.

Cross died of a drug overdose in 2012 in a Milwaukee hotel.

To confirm their suspicions that Cross had murdered Hammerberg, investigators asked the Milwaukee County Medical Examiner's Office to provide the DNA profile obtained during Cross' autopsy. The State Crime Lab compared Cross' DNA profile with the DNA obtained from the crime scene.

"It was a really good match," Johnson said.

Closure

The revelation was an incredible moment for the investigators who had committed years to working the case. Many detectives took turns on the case over the years. Most recently, the Ozaukee County Sheriff's Office had five people working on the case, including retired Capt. Jeff Taylor.

The case was personal for some, like the State Crime Lab analyst who kept the case when she was transferred from the Milwaukee office to the Madison office. Four people from the State

Crime Lab attended the press conference in Port Washington on Oct. 22.

"I think anyone who worked on the case felt a connection to it," Johnson said.

Although cracking the case was an impressive feat, Johnson said he feels mixed emotions, because Cross was never punished for raping, strangling and bludgeoning 18-year-old Hammerberg to death.

"I wanted him to face greater justice," Johnson said. "He stole Traci's life. He was able to live the life that he wanted, his way."

Contact Jeff Rumage at (262) 446-6616 or jeff.rumage@jrn.com. Follow him on Twitter at @JeffRumage or Facebook at www.facebook.com/northshorenw.