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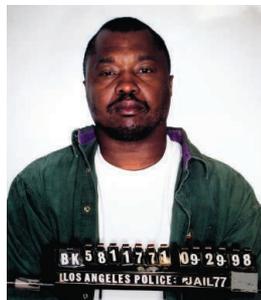
Familial DNA Testing Scores A Win in Serial Killer Case

A quarter-century of conventional detective work failed to track down the killer responsible for the deaths of at least 10 young women in south Los Angeles dating back to the mid-1980s. But a discarded piece of pizza and a relatively new method of DNA testing has finally cracked the case, police announced last week. On 7 July, L.A. police arrested Lonnie Franklin Jr., 57, a former garage attendant and sanitation worker they suspect is the serial killer nicknamed the “Grim Sleeper.”

Since 2008, California has allowed so-called familial DNA searches, in which investigators look for close but not exact matches between DNA evidence collected at crime scenes and the state’s data bank of DNA collected from 1.3 million convicted

Berkeley, School of Law.

Last week, *Science* spoke with two scientists involved with the DNA search, senior criminalist Steven Myers and case-work laboratory manager Gary Sims, both based at the Jan Bashinski DNA Laboratory in Richmond, California. They explained that the searches initially focus on 15 regions of DNA on 13 chromosomes. These regions contain genetic stutters called short tandem repeats, in which a pattern of base pairs repeats itself over and over. The number of repeats varies from person to person, and two people who are related are likely to have the same number of repeats at more of these sites. The lab’s analysis also considers how frequently a given variation occurs in the general popu-



Proud of their work. A familial DNA search by forensic scientists in California led to the arrest of Lonnie Franklin, the suspected Grim Sleeper killer.

felons. The method has a longer history in the United Kingdom, where it led to a conviction in a murder case in 2004. In Colorado, the method led to a guilty plea in a car-theft case in Denver last year.

The high-profile Grim Sleeper case may encourage other states to adopt familial DNA searches, but the method raises concerns about privacy and ethics, say some legal scholars. “It’s hard not to celebrate when an alleged serial killer is caught, but getting carried away based on glamorous cases like this one is a real mistake,” says Erin Murphy of the University of California,

lation: two people who share a rare variation are more likely to be related than are two people who share a common one.

Sims and Myers explained that the lab’s software uses this information to generate a ranked list of the convicted felons in the DNA database who are most likely to be first-order relatives—parents, children, or full siblings—of the person a DNA sample came from. (They say the statistics aren’t strong enough to identify more distant relatives, who share a quarter or less of their DNA.) When both individuals in question are male, the lab also looks at a similar number of short

tandem repeats on the Y chromosome, which should be an exact match between fathers and sons and between full brothers.

A 2008 search with DNA evidence from the Grim Sleeper crime scene came up empty. But a second search in April 2010 did turn up a potential match: a young man named Christopher Franklin who was convicted last year on a felony weapons charge. The DNA search along with the dates of the murders cast suspicion on Christopher Franklin’s father. After an internal review of the overall case, investigators at the Bashinski lab notified the L.A. police, who followed the elder Franklin and eventually got a DNA sample from a discarded piece of pizza. Lonnie Franklin’s DNA matched DNA from the crime scenes, and police arrested him at his home last week. Sims says the lab is proud of its work. “To put this whole thing together ... and see it pay off is very gratifying,” he says. “Nobody popped champagne bottles or anything like that, but we all feel like we earned our pay.”

“I think it’s great that this tool was used to catch this defendant,” says Hank Greely of Stanford Law School. But he cautions that the method does have downsides. His research suggests that in a database with DNA from a million individuals, hundreds or even thousands of people might have a close enough match to suggest a blood relationship, depending on the strictness of the test and the rarity of the genotypes being tested. If those matches cast suspicion on innocent people, the burden would fall disproportionately on African Americans, who are overrepresented in the U.S. prison population. “It does raise some concerns about discrimination,” he says.

For Murphy, these and other costs outweigh the benefits. “We in a free society work on the premise that you have a right to go about your business without answering questions from the government unless they have reason to suspect you of an offense,” she says. In her view, familial DNA testing upends that assumption because people can become the target of an investigation solely by virtue of sharing DNA with someone in the database.

Privacy and fairness are also concerns, she says. “It’s sending a message to the relatives of convicted people that their privacy is less valuable somehow than that of other law-abiding citizens,” Murphy says. “That, to me, is not worth the price.”

—GREG MILLER