

The Oklahoman

Forensic science expertise put to work on suspects, victims

Welcome to another intriguing episode of CSI – Oklahoma City, where DNA crime scene evidence from all over the world is brought to Oklahoma City-based DNA Solutions for its forensic science expertise.

In today's episode, our narrator, Brandt Cassidy, Ph.D., laboratory director for DNA Solutions and technical leader for the forensic work conducted by the company, describes a challenging case where evidence was sent to Oklahoma City by the U.S. Attorney's office in Phoenix.

Someone had been shot dead, and the bullets were sent to DNA Solutions for expert analysis.

"The question was: Was there DNA material on the bullets to confirm that they came out of the dead person's body?" Cassidy said. "We were able to find little bits of tissue stuck in the grooves of the bullets, pull them out, perform DNA analysis and match the evidence back to the individual.

"So, we were able to confirm that the bullets we received were actually the bullets from the dead person's body."

Another case closed by DNA Solutions.

The company works with medical examiner offices, police crime labs, private investigators and even defense attorneys to examine evidence using forensic science skills of its employees and advanced technology.



Jim Stafford

OK INNOVATIONS

Founded in Ardmore in 1998 as a spinout of the Samuel Noble Foundation, DNA Solutions was purchased by current owner Tom Kupiec, Ph.D., and relocated to Oklahoma City in 2004. It is a sister company to Oklahoma City's ARL Bio Pharma, also owned by Kupiec.

Both companies maintain offices and scientific laboratories in the University of Oklahoma's Research Park on the Oklahoma Health Center campus.

Forensic science usually involves cases in which crimes have been committed, Cassidy told me on a recent visit to the DNA Solutions laboratory. It could be a murder like the one he described from Arizona. Or it could be the theft of lumber from a protected forest (yes, trees have identifiable DNA), or even an animal poached out of season where DNA Solutions is called upon to identify the species of meat found in a freezer.

"DNA Solutions is a full-service forensics laboratory," Cassidy said. "We perform work internationally. Our human identification work expands into relationship testing for

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paternity analysis, and that involves reuniting families from all over the globe. Sometimes individuals who were adopted at birth are trying to find their parents."

Another area emerging into prominence is that known as "forensic genealogy," in which scientists attempt to identify suspects or even crime victims using DNA samples submitted to public databases by relatives or from ancestors. The recent "NorCal Rapist" case is an example of using forensic genealogy to match a suspect.

"DNA Solutions now offers that service to the forensics community, which is using this for investigative purposes, especially for unidentified remains," Cassidy said. "We're working with the National Center for Missing and Exploited children, where they have many cases of unidentified remains. That type of technology is on the forefront of where we are headed."

DNA Solutions employs 10 people, including two Ph.D. level scientists and two graduate students from the Forensic Science



Forensic DNA analyst Kelsey Lowther studies data for an investigation. [PHOTO PROVIDED]

Institute at the University of Central Oklahoma. It also shares employees with ARL.

"In Oklahoma, we have individuals at the Forensic Science Institute at the University of Central Oklahoma," Cassidy said. "They are well-trained individuals, and we're very lucky to have the first pick of those who are coming through the system."

As technology has become more sophisticated, the level of discrimination in identifying DNA "fingerprints" has gone up dramatically, Cassidy said. And the turnaround time for processing samples has fallen from a week or more to just a few hours.

While the company has relied on local universities for its skilled

workforce, support from granting agencies like the Oklahoma Center for the Advancement of Science and Technology (OCAST) has also contributed to its success, Cassidy said.

"We've been able to partner with OCAST through its internship program, which helps DNA Solutions, but also trains those individuals to be able to work in any biotechnology laboratory," he said. "And through OCAST we have received a number of grants that allowed us to put together resources for larger grants through the federal Small Business Innovation Research program."

The company has built a worldwide reputation for its expertise in forensic sciences, human relationship testing and

animal genetics. DNA Solutions was recently called upon to help identify some of the remains of more than 500 U.S. Marines killed and buried in a common grave in 1943 on the tiny Pacific island of Tarawa Atoll.

DNA samples obtained from the remains were used to find matches with living relatives.

"We do a lot of work with unidentified human remains, and we work with bone material," Cassidy said. "That's a specialty of our laboratory."

Another case closed by DNA Solutions.

Jim Stafford writes about Oklahoma innovation and research and development topics on behalf of the Oklahoma Center for the Advancement of Science & Technology (OCAST).