

By Joshua Kors

Code of Misconduct

Detectives decode animal DNA to identify abusers.

The crime shocked Brooklyn, N.Y. In October 2008, a 1-year-old tabby cat named Tommy Two Times was found severely wounded. Someone had stepped on the cat, soaked him with lighter fluid, and then set him on fire. Who committed the crime, and how could police and prosecutors prove the culprit's identity? For years, investigators in animal abuse cases had struggled to answer such questions. Animal victims couldn't name their abusers, so police depended on witnesses to expose the abusers' identities.

Those days are over. Today investigators have a powerful tool to finger the perpetrators of animal cruelty: *deoxyribonucleic acid (DNA)* evidence.

UNIQUE IMPRINT

DNA is a long, complicated molecule. It's found in almost every cell in your body. Your *genome*—the particular sequence of units in a DNA molecule—is as unique to you as your fingerprints. That uniqueness is helpful to police, who can sample the blood, say, at a crime scene and the blood drawn from a suspect's arm. If the DNA samples are identical, police can prove that the suspect was at the scene.





Beth Wictum (left) points out areas on a garment where tissue samples could be taken for DNA analysis in a criminal case.

For many years, human DNA has been submitted as evidence in U.S. courts. Only recently, however, did animal DNA make its first appearance.

“When people think of DNA, they think of humans. But all living beings have DNA: humans, dogs, cats, even plants,” explains Beth Wictum, director of forensic analysis at the University of California, Davis, Veterinary Genetics Laboratory. In her lab, Wictum compares the DNA of abused animals with the DNA in tissue samples found on weapons and criminal suspects.

“DNA evidence is a great tool for prosecutors,” says Wictum, who worked on the Brooklyn case. “It’s easy to collect because an animal’s DNA is found in its blood, its hair, even its saliva. And in court, it works as very strong evidence. If you have a dead dog and its blood has the same genetic profile as the blood found on the owner’s baseball bat, it makes the prosecutor’s job a lot easier.”

In the Brooklyn case, police solved the horrific crime by taking a small slice of the cat’s burnt flesh. Wictum’s lab then matched the DNA in that slice with the DNA in some burnt flesh found in a nearby vacant room. When police questioned two teenagers who admitted to breaking into the room, they knew they had found the perpetrators.

ISOLATING DNA

How do scientists identify the unique genetic profile in a sample of animal tissue? The decoding process is complex, notes Wictum.

First, she takes the tissue’s cells and submerges them in a *lysis solution*, a liquid that breaks the cells apart, exposing the DNA. The DNA-rich liquid is then placed in a *centrifuge*, a machine that spins the liquid at high speeds, separating the DNA from other molecules.

Once Wictum has isolated the animal’s DNA, she employs a process called a *polymerase chain reaction (PCR)*. It targets 15 *loci* (regions) within DNA that differ from one animal to another. Then it makes copies of each region so that there is enough DNA to study. A fluorescent dye is attached to each copy, enabling the DNA to be read by a computer. The result is a DNA profile that’s unique to the animal—“unless it has an identical twin,” says Wictum.

DNA decoding was first used in a criminal case in England in 1987. DNA samples established the innocence of one suspect and the guilt of another.

After that, DNA analysis proved successful in solving countless cases of human-on-human crime. Years passed, though, before it was used in cases of animal abuse. Wictum’s lab was one of the first to analyze animal DNA for criminal prosecutions.

The technology is proving tremendously helpful to U.S.

investigators who are dealing with an overwhelming number of animal abuse cases. Every year, more than 250,000 pets are abused, according to the Animal Legal Defense Fund (ALDF), a nonprofit organization that monitors animal cruelty.

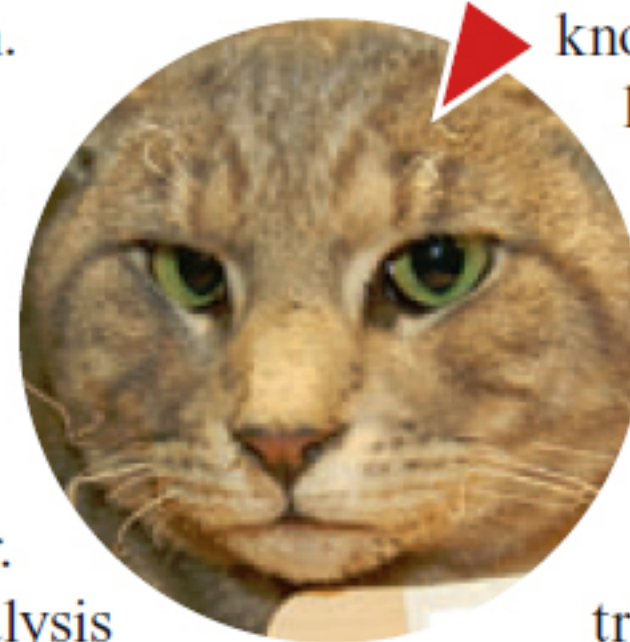
“DNA evidence has been a blessing to all of us who love animals,” says Scott Heiser, director of the ALDF criminal justice program. “As the testing gets faster and cheaper, more police and prosecutors will be open to pursuing DNA evidence.”

‘HEINOUS ACTS’

Police and prosecutors often hesitate to use DNA analysis in animal abuse cases for financial reasons. “DNA analysis takes time, and it costs money,” says Wictum. “But it’s worth it. When there’s a match, animal DNA can be the centerpiece of a prosecution.”

In the Tommy Two Times case, knowing that prosecutors had the DNA evidence in hand, one of the teens admitted to the crime. He was sentenced to two years in prison for animal cruelty. The other took his case to trial, where he was convicted of animal cruelty and also given a two-year sentence.

Referring to the second offender, judge Michael Gary said: “It’s mind-boggling to think one who is so intelligent would commit such heinous acts. ... There is no way the world should not know what [he] did here.” **CS**



Ladder of Life

DNA (deoxyribonucleic acid) is a twisted, ladderlike molecule. An exact copy exists in almost every cell in a person’s body. Each DNA molecule has millions of “rungs,” or *base pairs*.

Genes are segments of DNA that are many base pairs long. Genes manage all the processes in the body. Not all genes are active in every cell. In a muscle cell, for example, one set of genes is active and the rest are switched off.

The specific arrangement of genes is what distinguishes the DNA of one person from the DNA of another. When forensic scientists decode the specific arrangement of genes in DNA taken from a sample of blood, say, or hair found at a crime scene, they can compare it to the DNA code of a suspect.

