



# DNA Data Bank IDs Casualties

**T**he Department of Defense (DoD) is now obtaining blood and saliva samples from military personnel to establish a DNA specimen repository. The DNA data base will be used to identify the remains of casualties that cannot be identified by other means.

In 1991, then-Secretary of Defense Richard B. Cheney authorized what is now termed the DoD DNA Identification Registry, housed at the Armed Forces Institute of Pathology (AFIP) in Washington, D.C.

The AFIP, located at the Walter Reed Army Medical Center, is one of the world's leading institutes for the study of pathology and is overseeing the program.

"As part of the identification process for casualties, we normally rely upon dental and fingerprint comparisons," said Jim Canik, head of the identification laboratory at the AFIP.

"In many cases we are unable to get fingerprints because there are none that exist on the remains. Or there may be no dentition left for us to do a dental comparison. When that happens we have to go to other methods. And one of the new leading technologies for doing an identification is the use of DNA."

Canik said the DNA data base will be the most reliable way to ensure the identification of personnel.

According to Maj. Victor W. Weedn, chief of the Armed Forces DNA Identification Laboratory, AFIP, "The FBI rejects 15-30% [of the fingerprints] as unacceptable . . . Historically, the AFIP has been able to make identification through fingerprints in only approximately 70% of cases, either due to the lack of an antemortem record or due to the lack of printable fingers."

Since the military has no provisions in place to go back and reprint those unclassifiable fingerprints, 15 to 30 percent of military personnel simply have no prints on file.

Some of the same problems are present with dental comparisons. Canik said a panoramic repository for duplicate dental records was established in Monterey, Calif.,

Despite the misgivings of civil libertarians, the Defense Department is forging ahead with a centralized registry of genetic signatures for all service members that is proving far more accurate and comprehensive than fingerprints and dental records.

after an aircraft carrying 248 individuals crashed on its way back from the Sinai. "Their medical and dental records happened to be on board when it went down," Canik said.

He added, "We may also have problems with the quality of the dental panograph coming back, or there can be changes in the individual's dentition, and it's not updated in the record."

The idea to collect DNA samples for identification of military casualties came about during the Persian Gulf conflict. As a trial, DNA samples were collected from all soldiers deployed to the area.

Despite the swiftness of the battle, the Department of Defense felt DNA sampling was a good idea.

The Army began their official permanent data base collection by gathering samples from all military personnel sent to Somalia.

"We are now collecting a DNA specimen from every new Army enlisted person as they are processed through their initial medical screens," Canik said.

"We are already collecting from Navy personnel at their initial entry points [in Florida, Michigan and California]. We have also started with the Marine Corps at San Diego, and we should be coming on-line at Lackland Air Force Base in Texas sometime in the near future."

DNA samples of all 1.5-million members of the armed forces, including active and reserve components, will be collected over the next five years. By the turn of the century, all servicemembers will be on file in the repository.

Collections have continued at Ft. Knox, Ky.; Ft. McClellan, Ala.; Ft. Benning, Ga.; Ft. Leonard Wood, Mo.; Ft. Sill, Okla.; and Ft. Jackson, S.C.

The relatively painless procedure will involve collecting a blood sample, which will be stored in a freezer at minus-20 degrees.



A saliva sample will also be collected by running a cotton swab around the inside of the mouth to pick up cells. The saliva sample will be stored at room temperature.

"The saliva sample is our back-up source of DNA, if for any reason we would run into a problem with the bloodstain sample," Canik said.

The bloodstain will be collected on cards, which will include a fingerprint, signature and bar code. One card will be kept with an individual's medical records and another card will be stored in the DNA repository.

The specimens will be sent from their collection points to the AFIP, where they will be reprocessed and stored in vacuum-sealed packages. The bloodstain will then be frozen. All of this will preserve the integrity of the specimens and ensure their longevity.

Canik said the project's current budget for the year will be a little over one million dollars, which pays for all collection and laboratory operations and is expected to gradually increase as more and more personnel are sampled.

"A large part of the dollars actually go toward the collection kits that we are using to collect the material," Canik said. Each kit, which uses a special type of card and filter paper, costs three dollars. Storage costs run another two to three dollars for each specimen.

The AFIP notes that the program will save money in the long run by gradually phasing out the panograph dental repository and reducing possible litigation costs due to misidentification. The institute also points out that processing can now be completed within weeks, with DNA identification, as opposed to months.

Every cell of the body contains a DNA molecule about five feet long and 50 trillionths of an inch wide. The DNA molecule consists of a ladder or twisted spiral known as a double helix. Each ladder has approximately three billion rungs or base pairs formed by phosphate and sugar strands along with four kinds of nitrogen bases: adenine, thymine, guanine and cytosine.

DNA is found within every cell of the body, except reproductive cells and mature red blood cells. Each cell's recipe is divided into 23 pairs of chromosomes, and each chromosome holds a complete DNA molecule. All of this forms the complete physical, genetic and medical history of a human being.

The AFIP has promised that each specimen will be treated confidentially. Multiple

levels of electronic security have been built into the computer file system, and access to the specimens will be controlled and limited.

Canik stresses that the samples are only being stored. They will not be typed for diseases or anomalies.

"DNA is an expensive proposition," he said. "With the numbers of individuals, both in the active and reserve component forces, it would be cost prohibitive for us to try and do typing on everyone. We would not do any typing until an individual becomes a casualty."

"DNA is also a very big molecule," he added. "We are only looking at a portion of the molecule. It does have coding, of course . . . but we are only looking at what differentiates you from me and the pattern of how these base pairs are actually matched."

Despite these assurances, the American Civil Liberties Union (ACLU) has expressed reservations about the project.

"We're not only concerned about how the military might use this information, but how other branches of government might use it, too," said Janlori Goldman, director of the ACLU privacy and technology project. "While the Army says they will protect it against other uses, once you create a data base of this size and sensitivity, history has shown that it will be used for other purposes, and they will not be able to control it."

"They are creating a data base supposedly just for identification purposes in the event that people are missing or killed, but the temptation to use it for another purpose will become overwhelming."

Goldman added: "You'll find law enforcement agencies will want access to it; I think that's absolutely clear. If a crime occurs on a base and they have a forensic sample of blood or semen, they'll want to match it against the Army's existing genetic database. Any effort on the Army's part to restrict access, I think, will be unsuccessful. And I think they need to be honest about that."

Canik said the ACLU's concerns are unfounded. "Most people don't realize the amount of material in the outside world that people could get DNA from," he said. "If you've ever had a biopsy done, or if you've ever given blood and there's a specimen lying around with your name on it, they could get your DNA from that."

"DNA can be collected every time you brush your teeth in the morning and spit into the sink, or comb your hair. If people really wanted your DNA, they could get it very easily without you even knowing about it."

The AFIP concedes, however, that if served

with a court order to turn over a blood or saliva sample to a law enforcement agency, they would have to comply.

DNA identification was first used in criminal cases for identifying a suspect. Although the identification of the DNA molecule has been well documented over the past 40 years, the use of DNA technology has only been in existence since the mid-1980s.

"DNA is a new technology, and we're moving into newer and newer applications," Canik said. "It's a fastly evolving arena, and we're moving into second and third generation work at this point."

He said one question that always comes up is whether or not it's possible to search for an unknown individual. The answer is no. "Fortunately, in the military, we are dealing with a closed population, and we know who we've got. If we deal with someone in combat or in some mishap, we would go back and pull those individuals who would have been involved. This whole procedure is specific for identification and nothing else."

So far, the project has been 100 percent effective. "We were able to identify two of the individuals who were killed during Desert Storm," Canik said. "We have subsequently done some post-Desert Storm cases, and we've had to rely on DNA identification for recent aircraft mishaps."

Notably, Desert Storm was the first major war that involved significant numbers of casualties where DNA was utilized for identification purposes. No servicemember from that war was buried in a tomb labeled Unknown Soldier. The technology is now being used to help identify human remains from Vietnam.

## Interservice Rivalry

During a joint assignment at the Defense Logistics Agency, I overheard a group of military officers engaged in a bit of friendly interservice rivalry.

An Army officer bragged: "The Army has more boats than the Navy."

"That's no big deal," someone chimed in, "even Disney World has more boats than the Navy."

As if in defense of his service and to put the argument to rest, a Navy officer replied, "But don't forget, the Navy has a lot more 'Mickey Mouse' than Disney World."

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