



### B57 Avian Mitochondrial Typing For Forensic Identification

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After attending this presentation, attendees will have an awareness of how tools developed for human DNA testing can be scientifically broadened and applied beyond cats and dogs to the identification of exotic pet species and individuals.

This presentation will impact the forensic community and/or humanity by demonstrating how the DNA analysis tools developed for human forensic identification have a broader scientific context. These tools can be creatively applied to address animal-derived evidence and may contribute to crime scene investigations in novel and exciting ways.

Disputes involving the individual identification of lost or stolen birds are frequent. Exotic pets such as birds have a high monetary value. The temptation to keep a lost bird is profound, especially if the bird is socialized toward humans and has behaviors requiring years of patient training. Identification is difficult because birds of the same species have few, if any, distinguishing physical characteristics. Even the gender of most parrots is not obvious; most species don't exhibit external sexual dimorphism. Owners often hope their pets will recognize them or perform characteristic behaviors but birds are generally uncooperative in strange environments.

In a recent case Tallulah, an African Gray Parrot escaped from the apartment of David DeGroff and William Milan in Arlington, VA. A visitor had walked into and knocked out a sliding screen door. Startled, the bird flew out the doorway and into the trees below. DeGroff and Milan ran quickly outside and searched but to no avail. They paged the neighborhood with flyers and called all the local veterinary clinics and animal shelters. Then they waited, devastated and worried. The couple had raised Tallulah from a chick and had owned him for eleven years (interestingly, the bird had been sexed as a male by DNA analysis some years before. It is not uncommon for closely bonded bird owners to retain their bird's original name.). Besides his affectionate nature, he was very intelligent and an excellent mimic. He was the couple's child substitute.

A month later DeGroff called the D.C. Shelter again and was told that an African Gray Parrot had just been adopted. Using the Freedom of Information Act, he compelled the shelter to provide the contact information of the adopter, Nina Weaver. When called, Weaver refused to let DeGroff and Milan see the bird and rebuffed the couple's offer to buy another African Gray if the bird turned out to be Tallulah. DeGroff then embarked on his pursuit of justice. He hired an attorney and, through his veterinarian, contacted QuestGen Forensics. DeGroff had saved molted feathers from Tallulah for many years but otherwise had no biological sample. As with animal hair, mitochondrial typing was a possible option for linking Tallulah with the parrot held by Nina Weaver.

The attorney's job was to get a court order allowing a witnessed blood collection from the disputed bird. Over a year later, Ms. Weaver submitted a blood sample from a parrot she called "Toby" but the collection was not witnessed so the sample was set aside. After another six months, a witnessed sample collected from "Toby" was submitted. DeGroff was dying in a hospice; Mr. Milan attended but the bird was too stressed to allow meaningful recognition.

Sixteen sequences of the mitochondrial control region from African Grey Parrots were downloaded from Genbank, aligned, and invariant portions selected as primer sites for amplification and DNA sequencing. The primers successfully amplified a 460 base pair sequence with considerable individual sequence variation. In addition to DNA extracted from Tallulah's feathers, the witnessed "Toby" sample, and the non-witnessed "Toby" sample, DNA from sixteen African Grey parrots (routine gender testing samples from Zoogen) were sequenced and compared.

Twenty-five mitochondrial types were identified in the Genbank sequences and Zoogen samples combined. The Zoogen samples showed 11 types; one type was common (29%) suggesting a genetic bottleneck of African Gray Parrots caused by importation. The two samples reputedly from "Toby" had different mitochondrial types; only the first non-witnessed sample matched the feathers from Tallulah. The results suggest that a different bird had been brought to the witnessed collection so that DeGroff and Milan would not recognize Tallulah.

As of August 2005, Tallulah is still in Ms. Weaver's possession. David DeGroff died in April 2005 before hearing of the test results. Exhausted from the ordeal of his friend's death and in debt for legal fees, William Milan was considering whether to continue David's pursuit of justice as a tribute to his friend and Tallulah.

**Mitochondrial Typing, Forensic Identification, Avian**