

# Eyebrow Hairs From Cadavers as a Unique and Reliable Source of DNA for Profiling after Embalmmment

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## Abstract

This study reports the results of DNA profiling of Cadavers' eyebrow hairs as a unique and reliable source of DNA. In cases when bodies after death are embalmed, tissues become contaminated, and contain PCR inhibitors, disabling DNA profiling. We searched for good alternatives and considered eyebrow hairs or other hairs from the head, with follicles fully intact. Our experience has shown that hairs from the head or scalp do not offer much DNA, but eyebrow hairs have been found to, usually, offer much more. We believe that different hair products can act as PCR inhibitors, which in turn can prevent successful DNA amplification. We report DNA profiles obtained from eyebrow hairs collected from 15 cadavers, within 8-24 hours after embalming. The eyebrow hairs were placed in a PCR reaction tube, and directly amplified, upon which the PCR product was analyzed in an ABI 310 instrument. We successfully obtained full profiles on all eyebrow hairs collected.



## Methods

We obtained two eyebrow hairs from each of the cadavers. The average embalmmment time varied anywhere from 8-24 hours.



- Identifiler® (ID) kit, Applied Biosystems (cat# 4322288)
- Thermocycler, GeneAmp 9700, Applied Biosystems
- ABI 310 Genetic Analyzer

## DNA Amplification Procedure

### PCR setup:

- Add two eyebrow hairs in 200µl micro-centrifuge PCR reaction tube
- Add 10µl of DNase free water
- Add 15µl of ID kit, in the following ratio: 10µl of Reaction mix, 4.5µl of Primer, and 0.5µl of Tag Gold.
- Amplify samples at 32 cycles
- The parameters of the PCR:
  - Holding at 95 °C for 11 minutes
  - Denaturing at 94 °C for 60 seconds
  - Annealing at 59 °C for 60 seconds
  - Extension at 72 °C for 60 seconds
  - Holding at 60 °C for 30 minutes
  - Holding at 4 °C for infinity.

## Results

The data showed full DNA profiles when minimum of two eyebrow hairs were used.

Figure 1. represents electropherograms obtained from two hairs from the head, showing partial profiles.

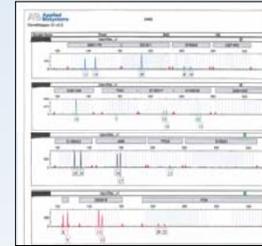


Figure 1. Nuclear STR-DNA profile from two hairs on the head

Figure 2. represents electropherograms obtained from two eyebrow hairs, showing full profiles.

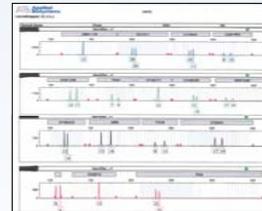


Figure 2. Nuclear STR-DNA profile from two eyebrow hairs

Table 1. contains information about samples tested.

Sample Number	Age (years)	Sex	Time elapsed after embalmmment (hours)
1	35	M	9
2	70	F	10
3	75	M	10
4	54	F	12
5	60	M	24
6	59	F	14
7	64	M	22
8	48	F	18
9	58	F	14
10	20	M	13
11	42	M	8
12	20	M	10
13	39	F	13
14	63	F	20
15	51	M	21

Table 1.

## Conclusion

It can often be difficult to obtain a full DNA profile from samples from a body that has already been embalmed. Buccal swabs are usually not obtainable due to jaw closure, and often times the tissue is affected by embalming chemicals, making DNA amplification impossible. Hair from the head can be a good source of DNA, but a minimum of five hairs is needed, and there is always a possibility that hair products can act as PCR inhibitors. We have found that eyebrow hairs of a cadaver would be the best alternative sample choice to obtain a DNA profile upon embalmmment of the body because eyebrow hairs tend to be preserved and untouched by embalmmment chemicals.

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## For Further Information

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