

DNA Typing of Hair Bulbs

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DNA analysis of hair bulbs is often restricted to the very low amount of DNA present in the bulb depending on the stage of maturation of the hair. Whereas STR DNA typing of plucked hairs (anagenic phase) is easily possible, telogenic hairs are mainly critical stain evidences. In general, more than 50% of telogenic hairs give no valuable results or fail completely, no matter what kind of extraction procedure is used (e.g. Chelex, TNE-extraction buffer, Phenol extraction etc.)

Concerning the hair in telogenic phase, there is obviously no correlation between the morphological form, size, pigmentation etc. and the success rate of DNA typing. The chance of positive PCR results is not predictable from the morphology, therefore every potential hair bulb has to be tested. We observed a great variability of useful results when several hairs from the same subject were tested as well as from different individuals.

This will be shown by a comparative study of four individuals, each tested for 20-80 telogenic hair bulbs, using a variety of STR multiple or singleplex systems: HUMTH01, HUMFGA, D18S51; (ABI) Bluekit, Greenkit II and Profiler.

Depending on the subject and the tested gen locus, DNA typing results were in a range from 0 to 65%. The great variability indicates, that there might be a "natural limit" in hair DNA analysis representing the individual processes of maturation and ageing of hairs.