NOVEL PROCEDURE FOR HIGH RECOVERY YIELD OF TRACE AMOUNTS OF DNA STORED AT ROOM TEMPERATURE

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Adsorption of macromolecules on solid surfaces is a well-known phenomenon, making it difficult to store very low amounts of DNA - such as in the case of forensic evidences - for long periods of time. Various degrees of loss are observed regardless of the DNA storage conditions, even when frozen at -80 °C. Trehalose and commercial matrixes have been shown to enhance recovery, but studies have been limited to one year. So, there is currently very little knowledge concerning effective ways to avoid losses upon long-term storage of trace amounts of DNA.

A first study was run to test various procedures aiming at improving the recovery of low amounts of DNA in conditions where control samples were almost totally lost. All these treatments, even those involving trehalose, were totally ineffective. In contrast, the use of a novel additive (*Tad*) allowed more than 90 % recovery.

In another study, various conditions of preservation were compared for long-term preservation (100-year simulated storage) of forensic samples. In the case of DNA samples stored in DNAshell®, it was found that the STR profiles and the intensity ratios were fully preserved and that the discrimination of the profiles was not affected. On the contrary, samples stored unprotected from the contact with air were totally unfit for STR analysis, due to either degradation or irreversible adsorption.

These results demonstrate that our DNA storage procedures may be suitable not only for DNA databasing, but also for long-term storage of minute amount of DNA extracted from crime scene evidence. ⌘