

## OPTIMIZATION STRATEGIES FOR DNA STORAGE

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DNA sample storage is paramount in forensic DNA, epidemiological, clinical and genetic database laboratories. In forensic laboratories there is always the possibility that cases may be re-opened and any stored DNA sample may need to be re-tested. This is especially important when the amount of DNA is limited. In addition to sample quantity, intrinsic differences in sample types resulting in differences in quality, extrinsic differences in the storage buffers especially ionic strength, tube surface type, exposure to UV and temperature of storage may lead to differences in the ability to recover and re-test the sample. Utilization of the most efficient storage method (buffer, tube and temperature) may prove critical in the ability re-test samples.

This is a continuation of a previous study (Smith et al. 2004) in which samples were stored at  $-20^{\circ}\text{C}$ ,  $-4^{\circ}\text{C}$  and  $25^{\circ}\text{C}$  for 3 months. Replicate samples stored in a  $-20^{\circ}\text{C}$  freezer were found to be the most stable as expected and as previously demonstrated (Jose, M., et al. 2004) and recommended (Budowle, B., et al. 2005). Surprisingly the  $-4^{\circ}\text{C}$  samples were less stable than those at  $25^{\circ}\text{C}$  presumably due to the exposure to freeze-thaw cycles in the frost free freezer (Range  $T^{\circ}\text{C} = -6^{\circ}$  to  $-22^{\circ}$ ). Four microcentrifuge tubes (Phoenix Max-715, Sorenson 16070, VWR 20170-666 and USA Scientific 02-1415-2500) were compared to evaluate whether denaturation was induced as has been previously described for polypropylene tubes (Gaillard, C., et al. 2001). In two separate experiments using 4 tubes of each type, it was found that the USA Scientific and VWR microcentrifuge tubes denatured the DNA upon contact. In this report, DNA stability of the  $-4^{\circ}\text{C}$  and  $25^{\circ}\text{C}$  samples after 9 months of storage and further evaluation of polypropylene induced DNA denaturation will be reported.

### References:

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- 3) Jose, M. et al. Stability of HCV, HIV-1 and HBV nucleic acids in plasma samples under long-term storage. *Biologicals* vol. 33, issue 1 (March 2005) 9-16
- 4) Smith, K and S Lee. 2004. Comparison of DNA storage methods. Poster presentation accepted for the 15<sup>th</sup> International Symposium on Human Identification. To be held, October 4-7, 2004. Scottsdale, AZ.  
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