ROOM TEMPERATURE DNA PRESERVATION AND HIGH THROUGHPUT METHODS FOR DECOMPOSING HUMAN TISSUE SAMPLES; AN ALTERNATIVE DVI APPROACH

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After a mass fatality incident adequate freezer facilities to house victims may not be available and therefore bodies decompose rapidly in hostile climates. In order to minimise the DNA degradation, and maximize throughput of samples for identification, an ideal preservative would protect the DNA within tissues whilst also leaching DNA into the surrounding solution. By maximising the quantity and quality of 'free' DNA in the preservative solution the time consuming steps of tissue digestion and DNA extraction may be eliminated.

We assessed how well five preservatives (LST, DESS, modified TENT, DNAgard® Tissue, Biomatrica®, and RNA*later*®, QIAGEN) protected the DNA within decomposing human skin and muscle samples, in addition to the "free DNA" in solution when stored at 35°C at 60-70% humidity for up to three months.

All solutions except the LST buffer adequately preserved the DNA in fresh and decomposed skin and muscle. RNA*later*® consistently generated the highest DNA yields. However, DNAgard® and the modified TENT buffer were the only two preservatives which consistently leached enough good quality DNA into solution for direct DNA isolation and successful genotyping. Results suggest that these two preservatives are better at protecting the 'free' DNA in solution than the others tested, and therefore may be the best candidates for use in cases of a mass disasters.