Frozen buffy coat samples from long-term storage (12 years) under the LIFECARE Cohort are still viable for whole exome sequencing

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ABSTRACT

Introduction: Rapid advancements in molecular biology through genomic analysis have led to the generation of big data and drastically improved our understanding of disease risk and pathogenesis. When sample collection and handling are fulfilled properly, DNA from frozen buffy coats stored for a long period still produces a good yield of DNA. The fundamental objective of this study is to evaluate the quality and quantity of isolated DNA from frozen buffy coat samples from the LIFECARE Cohort for downstream analysis like the Whole Exome Sequence (WES). **Methods:** 35 frozen buffy coat samples from the LIFECARE Cohort were analyzed. 50 to 100uL of buffy coats were extracted using the QIAamp-UCP-DNA-Micro Kit. DNA quantification and quality assessment were performed using ImplenNanoPhot_16nanophotometer and Denovix double-stranded-DNA broad-range assay to test the quantity, purity and integrity of the extracted DNA. **Results:** The median duration of storage for 35 frozen buffy coat samples was 12.23 years (range: 11.08 - 13.17 years). Based on nanophotometer results, the median yield and concentration of DNA obtained was 0.59 ng and 35.0 ng/µl, with a mean A260/A280 ratio of 1.82±0.05 and A260/A230 ratio of 2.21±0.31, all within the acceptable standard ratio range. Denovix Fluorescence Assays which measure intact dsDNA indicated a median yield and concentration of 0.34 ng and 38.0 ng/µl. **Conclusion:** DNA extracted from the 35 samples collected under the LIFECARE cohort with long-term storage was of good quality and concentration. Hence, the isolated DNA samples can be used for WES analysis or any downstream studies.