The Range of DNA Yield and Purity with Norgen's Saliva DNA Collection, Preservation and Isolation Kit

W. KIM, PHD[1] , M. EL-MOGY, PH.D[1] , M. ABDALLA, PH.D1 AND Y. HAJAHMAD, PH.D[1,2]
[1]NORGEN BIOTEK CORPORATION, THOROLD, ONTARIO, CANADA
[2]CENTRE FOR BIOTECHNOLOGY. BROCK UNIVERSITY, ST. CATHARINES, ONTARIO, CANADA

INTRODUCTION

In recent years attention has been turning to the use of non-invasive samples for genetic and diagnostic analysis, including the use of saliva. In contrast to blood samples, saliva can be self-collected, is less costly to ship and is easier to store and process. Human genomic DNA extracted from buccal epithelial cells and white blood cells found in saliva can be used in various applications including diagnostic assays, epidemiological studies and surveys.

The isolation of high quality DNA from saliva is not without its problems however. The number of DNA-containing cells found in saliva can vary significantly from individual to individual, and is often related to the health status of the individual. Adequate amounts of saliva must therefore be collected to ensure that DNA can be extracted in an amount sufficient for testing. This application note reports on the amount of DNA obtained from saliva using Norgen's Saliva DNA Collection, Preservation and Isolation Kit (Cat# 35700).

METHODS AND MATERIALS

DNA Isolation

Twenty-three different saliva samples were collected using Norgen's Saliva DNA Collection, Preservation and Isolation Kit (Cat# 35700). DNA was purified from 0.5 mL of the saliva/preservative mix according to the supplied protocol. An additional 55°C incubation step was carried out for one hour in order fully hydrate the purified DNA.

Determination of DNA Yield

DNA yield and purity (OD260/280) was determined using a NanoVue PlusTM (GE Healthcare) according to the manufacturer's instructions.

RESULTS AND DISCUSSION

The amount of DNA recovered from saliva samples can vary greatly depending on the collection method, preservation method, isolation method and the donor. A high yield of DNA is often required for certain downstream applications. Here, DNA was collected and isolated from 23 saliva samples using Norgen's Saliva DNA Collection, Preservation and Isolation Kit, and the yield from each sample determined using a NanoVue PlusTM .

The total average saliva DNA yield from 0.5 mL of the 23 saliva samples processed using Norgen's kit was 19.9 µ g. Based on this yield, it is expected that the average saliva DNA yield from 4 mL of saliva/preservative would be 159.2 µg. Figure 1 shows the expected saliva DNA yields from 4 mL of each of the 23 samples. The DNA yield from the 4 mL saliva/preservative samples stored for 1 day at room temperature is expected to be between 75.6 µg to 336 µg, with the average expected DNA yield to be 159.2 µg.

The value of OD260/280 was calculated to measure the purity of the DNA isolated from the 0.5 mL saliva/preservative samples (OD260 is corrected automatically by subtracting the value of OD320). The purity data from the 23 samples is shown in Figure 2, with an average purity of 1.68+0.06.

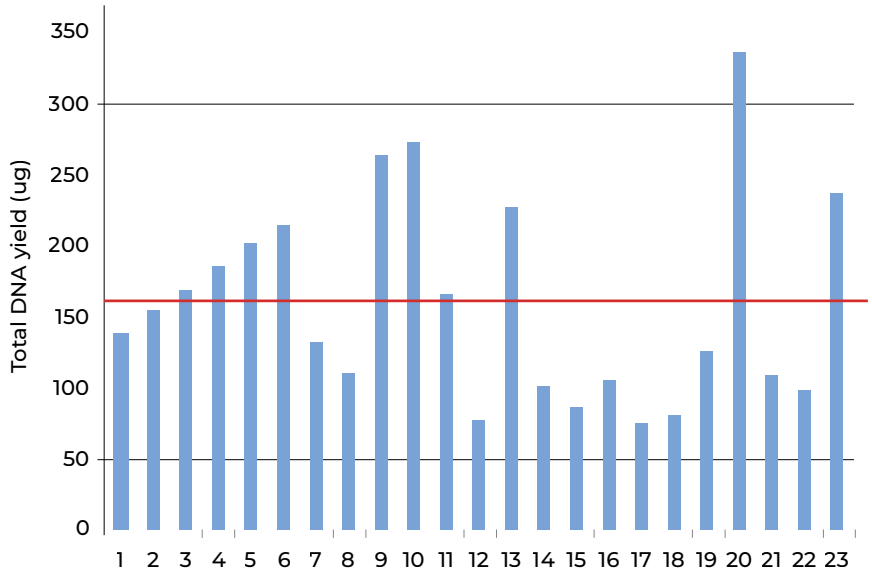

Figure 1. Expected Yield from 4 mL Saliva/Preservative Samples. DNA was isolated from 0.5 mL saliva/preservative samples using Norgen's Saliva DNA Collection, Preservation and Isolation Kit. Based on these results the expected yields from 4 mL of saliva/preservative samples were calculated and graphed.

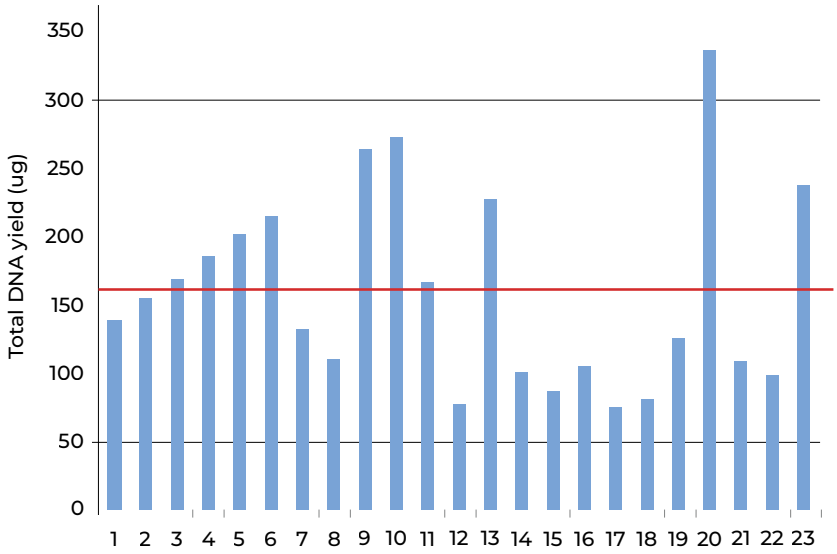

Figure 2. Histogram of DNA purity from 23 donors isolated using Norgen's Saliva DNA Collection, Preservation and Isolation kit.

CONCLUSIONS

The results demonstrate that the saliva DNA isolated using Norgen's Saliva DNA Collection, Preservation and Isolation Kit is of a high yield and purity. Norgen's Saliva DNA Collection, Preservation and Isolation kit offers a noninvasive method for the collection of saliva samples for use in diagnostic studies. The average DNA yield was 159.1 µg with an average OD260/280 of 1.68, an amount and purity higher than many other oral collection methods.

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