

DNA Yield with Oragene®•DNA

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Oragene•DNA gives higher DNA yields than other oral collection methods. The median yield of DNA from Oragene•DNA samples is 110 µg. In comparison, buccal swabs may yield as little as 1.9 µg of DNA.

Introduction

The number of studies collecting genomic DNA from a large number of individuals is increasing rapidly. Non-invasive methods and techniques that permit self-collection are preferred because they increase compliance rates and reduce costs. For this reason, many large-scale studies now use buccal cells from saliva as the source of DNA. The two most common methods are scraping the inside of the cheek with a brush and swishing the mouth with a mouthwash. Oragene•DNA is a DNA self-collection kit that is non-invasive and intuitive to use. The donor rinses his or her mouth with water to clear food particles and then spits 2 mL of saliva into the Oragene•DNA vial. Once the vial is closed, DNA is released and stabilized at room temperature.

The amount of DNA recovered from the oral cavity can vary widely depending on the collection method (Figure 1). This technical bulletin reports the amount of DNA obtained from saliva using the Oragene•DNA kit.

Collection method	Median DNA Yield (µg)	References
Cotton swab	1.9	Cozier et al. (2004)
Guthrie cards	2.3	Harty et al. (2000)
Cytobrush	6.8	Montserrat et al. (2001)
Mouthwash	35.1	Le Marchand et al. (2001)

Figure 1. Comparison of DNA yield obtained by different collection methods.

Materials and Methods

Saliva samples were obtained from 208 donors. Collection and purification of DNA was carried out according to protocols supplied with the Oragene•DNA kit. DNA yield was determined by the highly specific Fluorescence/DNase method (ref. 5). The F/D method quantitates DNA using SYBR Green I™ dye (Molecular Probes, Inc.) and DNase treatment.

Results

The DNA yield of Oragene•DNA/saliva samples from 208 donors is shown in Figure 2. The median amount of DNA was 110 µg. The 25th percentile was 62 µg and the 75th percentile was 158 µg.

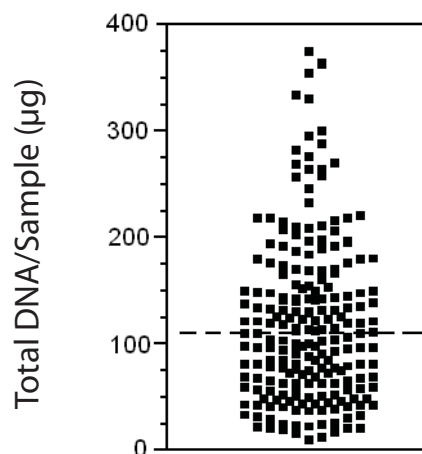


Figure 2. Scattergram of total DNA yield in 208 Oragene•DNA/saliva samples. The dashed line represents the median value—110 µg.

Conclusions

Oragene•DNA is a non-invasive DNA self-collection kit that can be used by untrained study subjects, including children and the elderly. The median DNA yield from Oragene•DNA/saliva samples is 110 µg. This is significantly higher than other oral collection methods.

References

- Cozier, Y., Palmer, J., and Rosenberg, L. (2003) Comparison of Methods for Collection of DNA Samples by Mail in the Black Women's Health Study. *AEP*. 14, 117-122.
- Harty, L., Garcia-Closas, M., Rothman, N., Reid, Y., Tucker, M., and Hartge, P. (2000) Collection of buccal cell DNA using treated cards. *Cancer Epidemiology, Biomarkers & Prevention*. 9, 501-506.
- Montserrat, G., Egan, K., Abruzzo, J., Newcomb, P., Titus-Ernstoff, L., Franklin, T., et al. (2001) Collection of genomic DNA from adults in epidemiological studies by buccal cytobrush and mouthwash. *Cancer Epidemiology, Biomarkers & Prevention*. 10, 687-696.
- Le Marchand, L., Lum-Jones, A., Saltzman, B., Visaya, V., Nomura, A., and Kolonel, L. (2001) Feasibility of collecting buccal cell DNA by mail in a cohort study. *Cancer Epidemiology, Biomarkers & Prevention*. 10, 701-703.
- DNA Genotek Technical Bulletin 3 Nov 2004, DNA Quantification Using the Fluorescence/DNase (F/D) Assay. 2004.