

## Collecting and Handling Saliva for DNA Analysis

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Over the last decade it has been established that saliva is an excellent source of DNA for many types of genetic studies. Research has revealed that salivary DNA is equivalent in quantity and purity to DNA obtained from blood,<sup>(1,2,3)</sup> and that the stability of salivary DNA is good when proper methods of handling are employed.<sup>(2,4)</sup>

### Extracting DNA from Saliva

Whole saliva is a mixture of the secretions from all of the various salivary glands located in the mouth, and it may also contain nasal and bronchial secretions, tears, blood from micro injuries in the mouth, serum exudates from the gums, and food and cellular debris. The DNA in saliva originates from cells that are shed from the inner linings of the mouth and from white blood cells. These DNA-containing cells are collected, and the DNA is then extracted by various methods.

### Collection Advice

The number of DNA-containing cells found in saliva can vary widely from one person to another. In order to insure that adequate amounts of DNA can be extracted, we request that 1.5-2.0 mL of saliva be collected from each participant. This amount will also allow the sample to be tested for hormones or other biomarkers, if requested.

Ask participants to follow these steps:

- Wait at least one hour after eating a meal before collecting saliva
- Rinse mouth thoroughly with water to remove any food particles or other contaminants, then wait *a full ten minutes* before collecting the saliva sample. Collecting saliva too soon after rinsing may reduce the amount of DNA that can be extracted, and it can also affect hormone/biomarker analyses.

Enzymes that degrade DNA are found in saliva and skin, so steps must be taken to protect the DNA. We advise that donors should wash hands beforehand and use disposable gloves while collecting samples. Then, depending on the intended use, we recommend the following:

*For genotyping analysis and hormone/biomarker measurement from the same sample:*

- Collect whole saliva by the passive drool technique into approved cryovials, hold on ice, and freeze at  $-20^{\circ}\text{C}$  as soon as possible. You may drool directly into the vial or use a short section of a drinking straw.

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- Note that some hormones have specific requirements for sample collection and handling. ***We urge you to contact us regarding proper techniques and collection supplies before collecting samples.*** Our *Saliva Collection and Handling Advice* booklet is available by request, or it may be downloaded from our website.
- If you have frozen samples that were already collected for a project and you wish to submit them to our genotyping service, please contact us for handling advice.

### *For genotyping analysis alone:*

- Collect whole saliva by passive drool into cryovials and freeze as described above.

***or***

- Use the Oragene•DNA® collection device to provide the convenience of integrated ambient temperature stabilization, sample transport, and sample preparation. The device is available in several formats. If using the tube format (OG-500), whole saliva should be delivered directly into the device by placing the kit against the lower lip and spitting into the funnel-shaped end. Detailed collection and mailing instructions can be found in the Oragene•DNA kit package.
- For small children or people who are uncomfortable with the drooling technique, use the Oragene sponges (CS-1 Accessory kit) to collect whole saliva that pools in the mouth. We recommend using at least three sponges to insure adequate volume is collected. Detach the sponges and place them inside the base of the disc format of the Oragene•DNA collection device (OG-250), then screw on the cap to release the stabilizing buffer. *Shake vigorously for 30 seconds to mix the saliva contained in the sponges with the buffer.*
- Additional formats of the Oragene•DNA collection device are also available, including one for animal use. Please visit [www.dnagenotek.com](http://www.dnagenotek.com) for more product and protocol information.



### **Labeling samples and shipping**

- Please contact us at [support@salimetrics.com](mailto:support@salimetrics.com) for instructions before collecting samples.

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### References

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- (2) Quinque, D., Kittler, R., Kayser, M., et al. (2006). Evaluation of saliva as a source of human DNA for population and association studies. *Analytical Biochemistry* 353(2): 272-77.
- (3) Rogers, N., Cole, S., Lan, H.-C., et al. (2007). New saliva DNA collection method compared to buccal cell collection techniques for epidemiological studies. *American Journal Human Biology* 19: 319-26.
- (4) Ng, D. P. K., Koh, D., Choo, S., Chia, K.-S. (2005). Saliva as a viable alternative source of human genomic DNA in genetic epidemiology. *Clinica Chimica Acta* 367(1-2): 81-85.