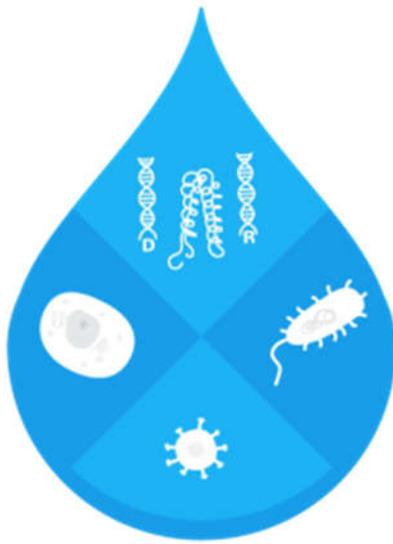


Why do we use saliva to determine your true biological age?



In recent years scientists made a significant leap in understanding the genetic basis of the health and disease. Genetics research, clinical diagnostics, as well as the development of personalized treatments all rely on analysis of high quality of genomic DNA. Traditionally, DNA has been extracted from whole blood. Red blood cells do not have any DNA, as they lose their nuclei (the compartment in a cell that contains the DNA) as they mature. So the DNA in your blood is in your white blood cells. White blood cells are an excellent source of large amounts of high-quality genomic DNA. However, because of the invasive and painful process, not mentioning the high cost of obtaining, storing, and transporting blood samples, researchers and clinicians have long searched for alternative methods.

Here comes a first surprise. Saliva is not just a watery substance containing some digestive enzymes and some epithelial cells (buccal cells) that is produced by glands in your mouth area. Studies show that up to 74% of the DNA in saliva comes from white blood cells^{1,2}. Yielding virtually the same amount of DNA per volume and the same DNA quality, saliva can be considered as good and as reliable a source of DNA for a wide variety of genetic applications.

Human saliva also contains bacteria and viruses, that can contaminate the genetic experiment. This was a major reason, why blood samples were used for genetic analysis. However, a growing number of genetic and genomic experiments demonstrates, that depending on the collection methods used, such contamination can be minimized. In addition, the majority of molecular biology and bioinformatics tools can be used in the downstream analysis to completely eliminate the effect of bacterial DNA on the genetic result. For example, when saliva was collected into a preserving solution directly (not using mouthwash or buccal swabs or cytobrushes), approximately 3-21% of total DNA was bacterial. This is substantially lower than mouthwash (>60%) or cytobrushes (>80%)^{3,4}. Thus, we are confident that we are analyzing DNA of human origin, with very low bacterial or viral content.

Blood collection is often considered the golden standard for DNA quality and it is an established practice across hospitals, clinics, and labs worldwide. Blood collection is a poor choice especially for the direct to consumer at-home collection procedure. The use of saliva in TruMe kits is non-invasive and a much easier technique for the collection of DNA samples. This means no needles for those of us who would rather not have blood taken with a needle, especially if it's not absolutely necessary. The saliva samples are collected into our proprietary preserving solution and don't require refrigeration like blood samples do, and they are good for up to six months after the collection has been taken. DNA testing to determine your true biological age can be an emotionally-difficult procedure, so using buccal swabs is one way to help make the process a little less stressful.

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3. Reiner, J. *et al.* Chromosomal Microarray Detection of Constitutional Copy Number Variation Using Saliva DNA. *J. Mol. Diagn.* **19**, 397–403 (2017).
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