

SaliFix: An All-in-One Saliva Swab Collection Solution

Introduction:

The ability to easily collect high-quality DNA samples plays a pivotal role in genetics research, diagnostics, ancestry, and lifestyle testing. Demand for saliva-based sampling has been growing and saliva collection is now a well-established and cost-effective method, giving comparable results to highly invasive blood sampling. Saliva samples are commonly collected by simply spitting into a tube, but in some cases, donors find this difficult. In addition, increasing demand for genetic testing also requires higher throughput solutions for sample collection and processing.

The SaliFix Saliva DNA collector is designed to combine the ease of swab-based collection with the quality of saliva sampling. When using the new SwabCatcher collection tubes, swabs attach to the caps after collection, allowing for easy removal in the lab. The sample tubes are automation friendly and barcoded for easy sample identification. This application note describes a typical workflow for the SaliFix kits, from sample collection and processing to endpoint genotyping analysis.

Methods & Materials:

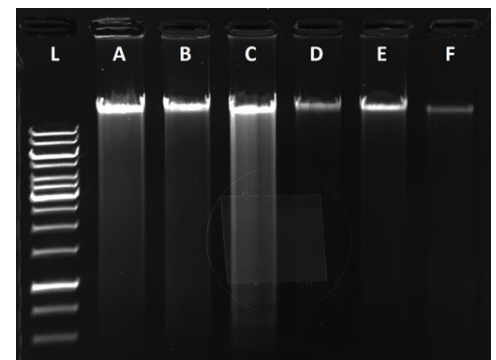
Six SaliFix saliva swab samples were collected from six unique donors (labelled A-F). Samples were collected by swabbing the mouth for 30-60 seconds, then placing the swab into the stabilising tube containing SaliFix stabilisation buffer. The collection swab was secured into the tube cap using SwabCatcher technology, allowing easy removal upon arrival at the lab for processing. Samples were stored at room temperature for 30 days prior to DNA extraction using the Isohelix Saliva-Prep DNA Isolation kit, following the 1ml extraction protocol, eluting into 100µl TE buffer.

Extracted samples were analysed for yield, purity, & DNA quality using agarose gel analysis. DNA quality was further evaluated using qPCR analysis targeting the ACTB housekeeping gene, using 1µl of each sample per reaction. In addition, samples underwent genotyping for three SNP markers (rs4149056, rs1801131, & rs9923231) using validated TaqMan® qPCR assays from Applied Biosystems. Genotyping calls using the SaliFix kits were compared against donor samples previously genotyped using an alternate collection method in order to evaluate the accuracy of SaliFix samples.

Results & Discussion:

Yield & Purity data: Yields from the (Table 1/Figure 1) six collected SaliFix samples averaged 3.63µg, ideal for the majority of downstream applications. A260/280 purity averaged at 1.91, indicating high-purity DNA extracted using the Saliva-Prep kit.

Sample	DNA Concentration (ng/ul)	Total Yield (µg DNA)	A260/280
A	42.00	4.20	1.88
B	35.60	3.56	1.87
C	93.20	9.32	1.89
D	14.70	1.47	1.94
E	23.00	2.30	1.93
F	9.03	0.90	1.96
Mean	36.26	3.63	1.91



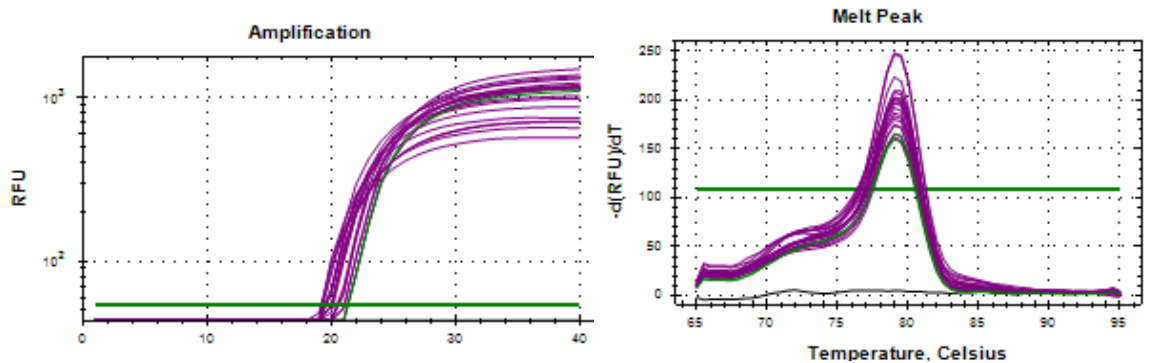
Table/Figure 1: DNA yield, purity, and agarose gel quality of saliva swab samples collected and stored using Isohelix SaliFix collection kits.

Isohelix is a division of Cell Projects

For swab or DNA isolation queries email: info@isohelix.com www.isohelix.com

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Sample	ACTB Cq
A	19.83
B	19.67
C	19.20
D	20.65
E	20.05
F	21.16
Mean	20.09



Table/Figure 2: qPCR amplification of SaliFix samples targeting the ACTB housekeeping gene, with consistent amplification and melt curves.

ACTB qPCR: All samples verified on ACTB qPCR amplified successfully with consistent Cq values (Table 2/Figure 2). Melt-curve analysis showed accurate and reliable amplification of the gene target.

Sample	SaliFix Genotype			Expected Genotype			Agreement?
	rs4149056	rs1801131	rs9923231	rs4149056	rs1801131	rs9923231	
A	TT	TG	CT	TT	TG	CT	✓
B	TT	TT	TT	TT	TT	TT	✓
C	TT	TT	CT	TT	TT	CT	✓
D	CC	TT	CT	CC	TT	CT	✓
E	TT	TT	CC	TT	TT	CC	✓
F	TT	TT	CT	TT	TT	CT	✓

Table 3: Comparison of SNP genotype calls obtained with donor samples collected using SaliFix with expected genotype controls.

SNP Genotyping: Genotyping of SaliFix samples (Table 3) was successful, with no failed or missed calls when compared to true variant controls for any of the three SNP's that were evaluated. DNA collected using the non-invasive SaliFix method gives consistent and dependable results and can be used for many downstream genetic analysis applications.

Key Takeaways:

- **Ease of Use:** Designed with user convenience in mind, SaliFix offers a straightforward collection process. Users simply swab the inside of their mouth, deposit the swab into the provided tube containing the stabilizing buffer, and seal it for preservation. This intuitive process can be easily performed by individuals of all ages and abilities.
- **Room Temperature Storage:** SaliFix uses our tried and tested GeneFix stabilization buffer, allowing for ambient storage of samples from months to years.
- **Automation:** SaliFix is designed with automation in mind, with easy to remove swabs and high-throughput compatible SwabCatcher tubes for batch sample processing.
- **Versatility:** Whether for research purposes, forensic analysis, or medical diagnostics, SaliFix caters for diverse applications. It facilitates DNA collection in various settings, including clinical laboratories, fieldwork environments, and home-based sampling. SaliFix is ideal for a range of downstream genetics applications, from qPCR and Genotyping Arrays to both Sanger and next-generation sequencing.