

Background:

Mawi DNA Technologies has developed the iSWAB sample collection system and Copan is producing FLOQSwabs™ (hDNA free, certified free of human amplifiable DNA, DNase and RNase free). The combination of the Mawi iSWAB system and Copan FLOQSwabs™ hDNA free integrates into a non-invasive sample collection and preservation technology that delivers between 10 - 30µg of DNA with < 1% bacterial contamination and can be used to easily collect samples from all population segments including infants and elderly. The Mawi iSWAB system captures buccal cells collected by Copan FLOQSwabs™ hDNA free at the point of collection, so there is no need to process swabs in the lab. Samples are stable at room temperature for >1 year. Samples collected by this system are ideal for downstream microarray or NGS platforms. Applications include genetic analysis, epigenetics, forensics, and animal testing. Although the system has been validated with different swab types, it was demonstrated by several customers that the Copan FLOQSwabs™ are compatible with Mawi iSWAB, and have been yielding a larger amount of nucleic acids.

Materials:



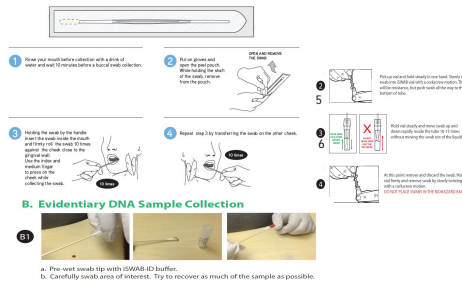
Study Methods:

The iSWAB -ID kits were prepared as follows: 3x kits were assembled with Copan FLOQSwabs™ hDNA free, 3x kits with Puritan Cotton-plastic handle, 3x kits with Puritan cytobrush, 3x kits with Puritan HydraFlock, 3x kits with Puritan cotton-wooden handle, 3x with Solon Rayon, 3 with Dynarex Cotton, and 3 with Solon MacroPur. An iSWAB-ID kit was prepared for each swab type.

- Collection Instructions
- Bar-coded iSWAB Collection Device
- Single sterile swab
- Bio specimen bag with absorbent pad
- Matching extra bar-code label



Buccal Sample Collection procedure for reference samples

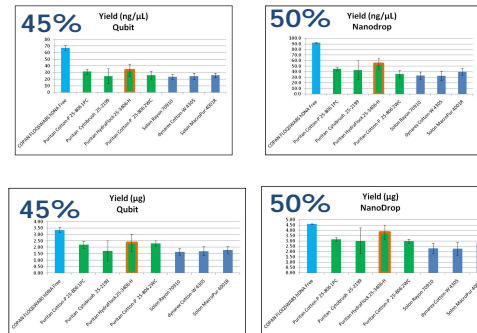


Study methods cont. :

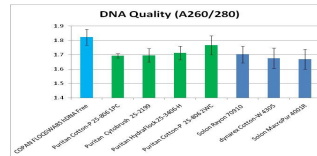
- A single volunteer collected 24x iSWAB-ID sample over 24 days (one sample/day)
- All samples were stored at ambient temperature post collection and then shipped to processing lab 3 days after the 24th sample was collected. The samples were shipped under standard shipping conditions with no cold chain involvement.
- Nucleic Acids extraction was performed with EZ1 Advanced XL DNA Investigator Card.
- DNA quantification was performed with NanoDrop and Qubit fluorimeters .
- Purified gDNA was further analyzed by electrophoresis on a 1% agarose gel

Results:

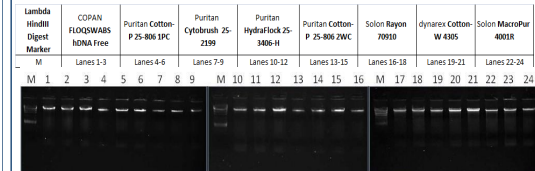
Human gDNA Yields/iSWAB-ID from Different Type of Swab



Swab Type	NanoDrop		Qubit		A260/280
	Yields (ng/µl)	Total Yields (µg)	Yields (ng/µl)	Total Yields (µg)	
COPAN FLOQSWABS hDNA FREE	92.0 ± 0.6	4.6 ± 0.03	67 ± 3.8	3.35 ± 0.19	1.8 ± 0.1
Puritan Cotton-P 25-806 1PC	45 ± 2.7	3.15 ± 0.19	31.5 ± 3.9	2.21 ± 0.28	1.7 ± 0.02
Puritan Cytobrush 25-2399	43.0 ± 17.5	3.01 ± 1.22	24 ± 11.3	1.72 ± 0.79	1.7 ± 0.05
Puritan HydraFlock 25-3406-H	54.4 ± 9.9	3.81 ± 0.69	33.4 ± 9.4	2.34 ± 0.65	1.7 ± 0.05
Puritan Cotton-P 25-806 2WC	35.8 ± 6.7	2.97 ± 0.2	25.9 ± 6.3	2.31 ± 0.21	1.8 ± 0.1
Solon Rayon 70910	32.8 ± 6.7	2.29 ± 0.47	23 ± 3.6	1.66 ± 0.25	1.7 ± 0.1
dynarex Cotton-W 4305	32.3 ± 8.3	2.26 ± 0.58	24.3 ± 5.0	1.7 ± 0.35	1.7 ± 0.1
Solon MacroPur 4001R	40.3 ± 6.0	2.82 ± 0.42	25.8 ± 3.7	1.81 ± 0.26	1.7 ± 0.1



Human gDNA Gel Analysis



Regardless of swab material used with iSWAB-ID all collected samples produced intact and non-fragmented high molecular weight gDNA

Summary:

- Mawi iSWAB™ has a proprietary tube insert design that maximizes the release of samples collected by a Copan FLOQSwabs™ (hDNA free, certified free of human amplifiable DNA, DNase and RNase free), into a proprietary buffer that allows for long term stabilization and room temperature storage of human DNA.
- iSWAB technology eliminates the need for swab retention.
- Samples can be collected and concentrated in an iSWAB device using single or multiple swabs.
- Less than 1% microbial genomic DNA contamination results in pure sample DNA.
- Skipping swab drying process allows fast sample collection (< 1 min).
- Swab-free sample transport decreases sample processing and potential for cross contamination time without compromising sample integrity.
- Long-term room temperature stability reduces sample storage and transport costs by eliminating cold chain requirements.
- Manual and automation friendly tubes for scalability and cost efficiencies.
- iSWAB-ID efficiently recovered and stabilized DNA of forensic significance at the point of collection.
- DNA stabilized in iSWAB-ID at ambient temperature remained of sufficient quality to analyze for at least 2 weeks.
- Unlike processing traditional swabs, collecting samples with iSWAB-ID allows sufficient amount of sample for multiple runs for analysis and archiving purposes
- Accelerated stability testing of DNA collected with iSWAB-ID suggest >5 year stability at room temperature.

Conclusions:

- iSWAB-ID generates high quality gDNA regardless of the swab type used.
- End user has different options of swab types to include or use with iSWAB-ID kits or Racks.
- COPAN FLOQSwabs™ hDNA Free provided the highest yields and least variability among all the swab types tested.
- We highly recommend the combination of Copan FLOQSwabs™ with Mawi's iSWAB sample collection system.