

History

Earlier swab studies have shown that the cotton swabs most commonly used in collection of biological fluids do a very good job of absorbing fluids, but do not easily release cells for DNA profile development.

Theory

The RapidHIT ID System allows the used swab to be removed after testing. The extraction method used on the RapidHIT is not as rigorous as conventional DNA extraction methods, potentially leaving enough DNA on a swab for re-analysis. If a sample contains enough DNA, it may be possible to re-analyze a swab using conventional DNA methods after it has already provided a full profile via the RapidHIT. If so, a single swab may provide both a quick investigative lead as well as a confirmatory test.

Methods

This study was designed to determine if, after Rapid DNA testing, a standard cotton swab retains enough DNA to produce a full profile using conventional DNA analysis methods.

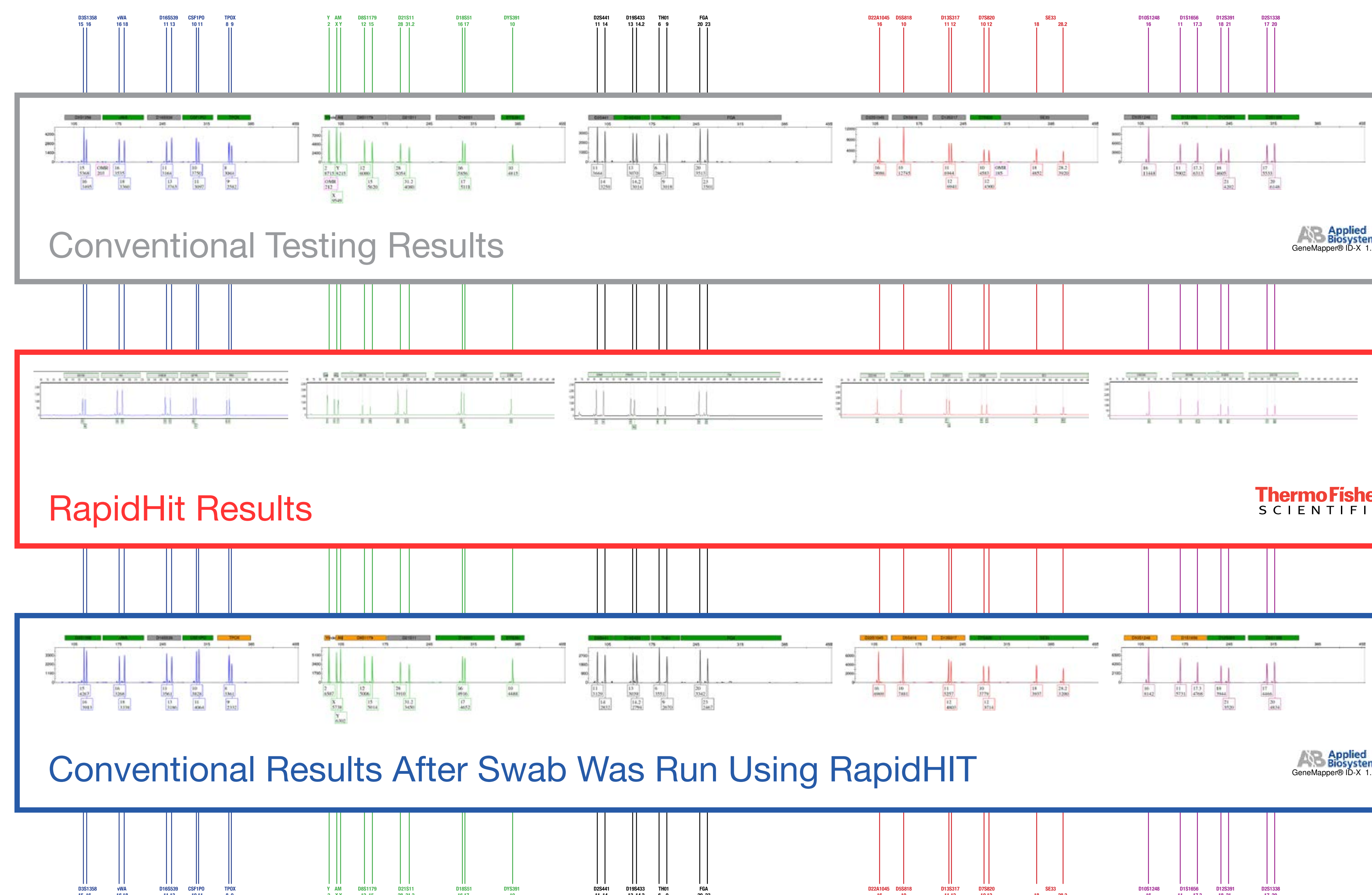
Several samples were run using the RapidHIT ID System, removed, allowed to dry, then re-analyzed using conventional DNA methods.

Duplicate samples were also run using only conventional DNA methods to check the accuracy of the data produced by the RapidHit.



Generate both rapid and confirmatory DNA profiles from a single swab.

One-Swipe Buccal Swab Comparison Profiles



Results

- Samples of blood, buccal swabs, and abbreviated cheek swabs provided sufficient DNA samples for first rapid and then conventional DNA testing.
- In all cases, full profiles were obtained by both the RapidHIT and conventional DNA testing.
- Concordant results were produced between duplicate samples run first on the RapidHIT ID System, and then conventional DNA methods.

Sample Breakdown

Sample Name	Sample Quantity ng/ul	Total Quantity ng	Loci Count - DNA Profile
Buccal swab right cheek-1	18.41	920	24/24 - Full profile
Buccal swab right cheek-2	19.68	984	24/24 - Full profile
Buccal swab left cheek-1	27.31	1350	24/24 - Full profile
Buccal swab left cheek 2	7.39	369	24/24 - Full profile
6 swipes of 1 cheek	23.91	1195	24/24 - Full profile
4 swipes of 1 cheek	6.79	339	24/24 - Full profile
2 swipes of 1 cheek	23.74	1187	24/24 - Full profile
1 swipe of 1 cheek	12.12	600	24/24 - Full profile
75 µl blood	13.84	692	24/24 - Full profile
50µl blood	5.47	273	24/24 - Full profile
40µl blood	2.21	110	24/24 - Full profile
30 µl blood	5.5	275	24/24 - Full profile
20µl blood	4.36	218	24/24 - Full profile

Further Study

These tests were performed with high level DNA samples. The next phase would be to determine how well this process works with lower-level or crime scene samples without risk of sample consumption or downstream issues in court.

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