ORAcollect®·Dx

Product handbook

DNAgenotek®

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Subsidiary of OraSure Technologies, Inc.

Superior samples
Proven performance

IVD CE MD UK CA

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Intended use

ORAcollect®•Dx is intended for the collection of saliva samples for diagnostic testing of human DNA. Saliva samples may be collected by a healthcare professional or non-healthcare professional, such as a lay user. Saliva samples collected using ORAcollect•Dx are stabilized and isolated for use in downstream diagnostic testing applications. Saliva samples collected using ORAcollect•Dx can be transported and/or stored at ambient conditions.

Summary and explanation of use

ORAcollect•Dx is a collection kit that provides the materials and instructions for collection and stabilization of human DNA from saliva samples.

Features

ORAcollect•Dx is a superior alternative to buccal swabs and offers several advantages:

- ORAcollect•Dx saliva samples can be self-collected
- ORAcollect•Dx devices are intended for use in over-the-counter (Direct-to-Consumer) downstream diagnostic testing applications
- Collection of sample is simple and gentle for donor
- Efficient collection is ideal for clinical workflows
- DNA integrity is maintained at ambient temperature for transportation by regular mail
- Samples can be exposed to temperature fluctuations between -20°C and 50°C (-4°F and 122°F) during transport
- Bacteriostatic reagent inhibits growth of bacteria from time of sample collection to processing
- Liquid sample (no cutting of tips) eliminates manual steps and reduces the chance of errors and cross contamination, while facilitating efficiency in the lab
- High-quality DNA sample enables downstream analysis with proven clinical utility
- Format optimizes laboratory efficiency
  - Use with liquid-handling robots
  - Minimal hands-on technician time
  - Compatible with standard labware
  - Integrated barcode on tube for workflow efficiency and sample traceability

Materials

Each single-use ORAcollect•Dx (OCD-100/OCD-100A) kit includes the following:

Format	Stabilizing liquid volume	Device with sponge**	Instructions for Use
OCD-100	1 mL	✓	✓
OCD-100A***	1 mL	✓	✓

** Device contains stabilizing liquid
*** Device contains insert

Warnings and precautions

1. IVD In Vitro Diagnostic Medical Device/ MD Medical Device.*
2. For In Vitro Diagnostic Use.
3. For Prescription and Direct-to-Consumer Use.
4. Do NOT use if packaging is damaged or device is broken or leaking. Discard unused, damaged or leaking kits in accordance with appropriate regulations.
5. Do NOT use ORAcollect•Dx beyond the Collect sample by (Use by) date indicated on the device.
6. Report any serious incident to DNA Genotek and the competent authority in your country.
7. Only use the components and accessories provided with the kit.
8. Collection precautions:
   - Read all instructions carefully prior to sample collection; deviation may result in inadequate sample and impact DNA yield.
   - Do NOT eat, drink, smoke, or chew gum for 30 minutes before sample collection.
   - Ensure the sponge tip does not come into contact with any surface prior to collection.
   - Choking hazard: Caution should be used when inserting the sponge into the donor's mouth.
   - Donors with xerostomia (dry mouth) may not collect adequate sample using these instructions, resulting in lower DNA yield and an invalid sample.
   - Wash with water if stabilizing liquid comes in contact with eyes or skin.
   - Do NOT ingest stabilizing liquid.
9. This device may not collect an adequate DNA sample for your genetic analysis. The concentration and quality of the DNA sample collected with this device should be measured prior to conducting genetic testing.
10. Genomic DNA isolated from saliva samples collected using ORAcollect•Dx will contain a small amount of bacterial DNA (see page 8).
11. Decontaminate and dispose of all specimens, reagents and other potentially contaminated materials in accordance with local, state and federal regulations.
12. This product requires the handling of human saliva specimens.
13. Material Safety Data Sheet (MSDS) is available at www.dnagenotek.com.

Product use limitations

1. ORAcollect•Dx is intended for collection and stabilization of human DNA from saliva; it is NOT intended for the collection and stabilization of RNA, protein or hormones.
2. Test manufacturers must validate the use of ORAcollect•Dx for their specific indications for use.

* Per applicable regulatory requirements, this device may be a medical device or in vitro diagnostic medical device.

3. ORAcollect•Dx has only been validated for use with germline testing.
4. For use in individuals 18 years of age and older.

Donor collection instructions

Catalog number	Donor collection instructions document number
OCD-100	PD-PR-00949
OCD-100A	PD-PR-01123

Transportation of ORAcollect•Dx

Pre-collection

ORAcollect•Dx kits can tolerate temperature fluctuations between -20°C and 50°C (-4°F and 122°F) during transport.

Post-collection

Saliva samples collected with ORAcollect•Dx can tolerate temperature fluctuations between -20°C and 50°C (-4°F and 122°F) during transport.

For domestic or international shipments, specimens should be packaged and labeled in compliance with applicable state, federal and international regulations covering the transport of clinical, diagnostic or biological specimens.

Storage of ORAcollect•Dx

Pre-collection

ORAcollect•Dx kits can be stored between 15°C and 25°C (59°F and 77°F) for up to 24 months.

Post-collection

Store ORAcollect•Dx saliva samples at room temperature for up to 60 days.

Purification and quantification

ORAcollect•Dx performance has been established using the following protocols:

1. ORAcollect•Dx saliva samples were purified in accordance with the manufacturer's protocol for QIAGEN® QIAamp® DNA Mini Kit (Cat. No. 51304) *DNA Purification from Blood or Body Fluids (Spin Protocol)*.
2. We recommend quantifying DNA using fluorescent dyes specific for double-stranded DNA (PicoGreen® or SYBR® Green I).

Performance characteristics (representative dataset)

The results obtained during studies of product performance support the following claims:

Usability and Instructions for Use comprehension

Usability testing was done using the FDA guidance document "Applying Human Factors and Usability Engineering to Medical Devices" (February 2016) to demonstrate the safety and effectiveness of ORAcollect•Dx for use in Prescription Use and Direct-to-Consumer Use.

ORAcollect•Dx device performance data

Data from samples collected using the ORAcollect•Dx device is used to support product performance charateristics. In this study, 80% of donors were naive to the collection device.

ORAcollect•Dx usability study for Prescription Use (K152464)[1]:

101 naive participants were observed completing the sample collection process; the overall task success rate was 94%.

Specimen adequacy across the entire study population:

- 99% of samples had a concentration of DNA ≥ 2 ng/µL
- 100% of samples had an A_{260}/A_{280} ratio between 1.2 and 2.3

Results of task success and specimen adequacy demonstrate successful device use by naive users in a Prescription Use setting.

ORAcollect•Dx usability study for Direct-to-Consumer use (K212745)[2]:

389 naive participants were mailed a sample collection device to their home. They were instructed to follow the instructions for use and return the collected saliva sample by mail.

- 95% of participants demonstrated full compliance with shipping instructions and 99.5% of the specimens contained sufficient DNA after extraction.
- 100% of extracted samples had a call rate of 99.7% on the A1AT genotyping test.
- 324 participants also returned a comprehension questionnaire and each question was answered correctly by ≥ 95% of the participants.

Results of user comprehension, compliance with shipping instructions and sample adequacy demonstrate successful device use by naive users when used in a Direct-to-Consumer setting.

Analytical performance (representative dataset - K152464)

OCD-100/OCD-100A

Overall data

	DNA concentration (ng/µL)	Total DNA yield (µg)	A_{260}/A_{280} ratio
N	156	156	156
Mean ± SD	11.77 ± 6.59	2.94 ± 1.65	1.75 ± .15
Median	10.50	2.63	1.74

Summary of method comparison genotyping results

	Samples tested	Correct calls	Incorrect calls	No-call	% agreement
Final pass	156	155	0	1[†]	99.4%

[†] Investigation of original and re-extracted DNA samples found no-call was likely due to extraction procedure or operator error.

Interfering substances

Both endogenous and exogenous potentially interfering substances were added separately to ORAcollect•Dx saliva samples from donors with known genotypes. Addition of tested substances had no effect, as demonstrated through testing on eSensor® Warfarin Sensitivity Saliva Test. All samples gave a correct call after retest.

Summary of eSensor® Warfarin Sensitivity Saliva Test results for interfering substances

Method	Samples tested	Correct call	Incorrect call	No-call	% agreement
Amylase	14	14	0	0	100%
IgA	14	14	0	0	100%
Hemoglobin	14	14	0	0	100%
Total protein	14	14	0	0	100%

Activity	Time point	Samples tested	Correct call	Incorrect call	No-call	% agreement
Eating	30 minutes	9	9	0	0	100%
Drinking	30 minutes	9	9	0	0	100%
Chewing gum	30 minutes	7	7	0	0	100%
Smoking	30 minutes	5	5	0	0	100%
Mouthwash	30 minutes	5	5	0	0	100%
Brushing teeth	30 minutes	9	9	0	0	100%

Reproducibility

Three samples (collected using 3 lots of ORAcollect•Dx, OCD-100) from each of 10 donors were processed by 3 different operators on multiple days. Each operator extracted DNA from each sample using the QIAGEN QIAamp DNA Mini Kit, followed by determination of DNA concentration and A_{260}/A_{280} ratio for all samples. Three operators tested the extracted DNA samples on the eSensor Warfarin Saliva Sensitivity Test. Genotyping data was evaluated after first pass results and all samples were concordant to bidirectional sequencing.

Summary of results stratified by operator

		Operator 1	Operator 2	Operator 3	Combined
Samples tested		20	20	20	60
DNA concentration (ng/µL)	Mean ± SD	11.80 ± 4.72	10.63 ± 4.12	10.54 ± 3.95	10.99 ± 4.24
	Median	10.61	9.86	9.95	10.33
Total DNA yield (µg)	Mean ± SD	3.08 ± 1.27	2.66 ± 1.03	2.64 ± 0.99	2.79 ± 1.10
	Median	2.70	2.46	2.49	2.61
A_{260}/A_{280} ratio	Mean ± SD	1.64 ± 0.07	1.66 ± 0.03	1.68 ± 0.06	1.66 ± 0.06
	Median	1.64	1.66	1.67	1.66

	SNP	Samples tested	Correct calls	Incorrect calls	No-calls	% agreement
Operator 1	2C9*2	20	20	0	0	100%
	2C9*3	20	20	0	0	100%
	VKOR	20	20	0	0	100%
Operator 2	2C9*2	20	20	0	0	100%
	2C9*3	20	20	0	0	100%
	VKOR	20	20	0	0	100%
Operator 3	2C9*2	20	20	0	0	100%
	2C9*3	20	20	0	0	100%
	VKOR	20	20	0	0	100%
Combined	2C9*2	60	60	0	0	100%
	2C9*3	60	60	0	0	100%
	VKOR	60	60	0	0	100%

For multisite device reproducibility, a total of 90 ORAcollect•Dx samples were extracted by 3 operators at 3 sites for a total of 270 sample aliquots (90 aliquots per operator). Each operator analyzed the 90 extracted DNA samples for DNA concentration and A_{260}/A_{280} ratio.

		Site 1	Site 2	Site 3	Combined
Samples tested		90	90	90	270
DNA concentration (ng/µL)	Mean ± SD	11.01 ± 6.43	18.00 ± 8.71	13.87 ± 10.57	14.29 ± 9.17
	Median	9.70	16.04	11.58	12.50
Total DNA yield (µg)	Mean ± SD	2.75 ± 1.61	4.50 ± 2.18	3.47 ± 2.64	3.57 ± 2.29
	Median	2.42	4.01	2.89	3.12
A_{260}/A_{280} ratio	Mean ± SD	1.65 ± 0.06	1.79 ± 0.13	1.79 ± 0.07	1.74 ± 0.11
	Median	1.66	1.80	1.79	1.75

Sample stability

Samples were stored at room temperature (RT) for 60 days or subjected to 3 freeze-thaw cycles (-20°C and 50°C/-4°F and 122°F). At the study time point, DNA was extracted and analyzed for yield and A_{260}/A_{280} ratio. Samples stored at room temperature were analyzed for microbial content using a real-time PCR-based assay. A subpopulation of samples were tested on the eSensor Warfarin Sensitivity Saliva Test.

Summary of post-collection sample stability study results

	Temperature	RT	Freeze-thaw cycles (-20°C and 50°C/ -4°F and 122°F)
	Time (days)	60	
ORAcollect•Dx	Yield	●	●
	A_{260}/A_{280} ratio	●	●

● Samples meet acceptance criteria (yield ≥ 10 ng, A_{260}/A_{280} ratio 1.2–2.3).

Summary of eSensor Warfarin Sensitivity Saliva Test results for sample stability study

First pass					
Format	Samples tested	Correct calls	Incorrect calls	No-calls	% correct calls
ORAcollect•Dx	40	40	0	0	100%

Microbial content of samples stored at room temperature for 60 days

Samples stored at room temperature for 60 days exhibited no significant change in microbial content.

ORAcollect•Dx		Baseline	60 days
Samples tested		30	30
% microbial content	Mean ± SD	5.35% ± 3.79%	5.19% ± 3.70%
	Median	4.38%	4.07%
	Min, Max	0.70%, 14.43%	0.86%, 14.45%
	P-value	0.7958	

Biocompatibility

Biocompatibility testing of the materials included in ORAcollect•Dx (OCD-100) was completed.[1,3]

In summary, the results of the biocompatibility studies demonstrated that:

- The device is not considered to have a cytotoxic effect.
- The device is classified as non-sensitizer.
- The device is non-irritant to buccal tissues.

Medical device symbol chart

REF	Catalog number
IVD	In vitro diagnostic medical device*
CE	CE marking
UKCA	UKCA marking
	Manufacturer
MD	Medical device*
	Do not re-use
	Consult instructions for use
	Collect sample by (Use by)
LOT	Lot number
EC REP	Authorized Representative
CH REP	Swiss Authorized Representative
UDI	Unique Device Identifier
15°C–25°C (59°F–77°F)	Storage instructions

**Per applicable regulatory requirements, this device may be a medical device or in vitro diagnostic medical device.*

Patent information

Patent (www.dnagenotek.com/legalnotices)

Troubleshooting

Collection

Observation	Action
There is no stabilizing liquid in the device or the device is leaking.	Do NOT allow donor to use the product; discard and request a replacement kit.
Stabilizing liquid comes into contact with eyes or skin.	Get donor to wash with water if stabilizing liquid comes in contact with eyes or skin. For safety data information, consult the MSDS at www.dnagenotek.com.

Post-collection (before purification)

Observation	Action
Saliva sample is cloudy, discolored and/or has floating particles.	Sample appearance may indicate that the donor did NOT follow the instructions for use. However, this is unlikely to affect sample quality or performance as evaluated on GenMark Diagnostics' eSensor Warfarin Sensitivity Saliva Test. Interference studies have demonstrated that such samples should not impact the genotyping results. Substances outside the scope of the interference study have not been evaluated; thus, caution should be taken when testing samples of abnormal appearance. Such samples may require re-collection in accordance with the instructions for use. According to donor instructions for use, ensure donor abstains from eating, drinking, smoking, or chewing gum for 30 minutes prior to donating a sample.
Sample is difficult to pipette.	Prior to sample purification, heat the entire sample in its original container at 50°C (122°F) for at least an hour.
Sample leaked.	Donor error. Re-collect sample.

DNA yield

Observation	Action
Low DNA yield and invalid sample use due to dry mouth (xerostomia).	Sample re-collection is recommended.

References

1 510(k) Substantial equivalence determination decision summary assay only template (510(k) number K152464). [PDF]. http://www.accessdata.fda.gov/cdrh_docs/reviews/K152464.pdf

2 510(k) Substantial equivalence determination decision summary assay only template (510(k) number K212745). [PDF]. https://www.accessdata.fda.gov/cdrh_docs/reviews/K212745.pdf

3 Based on the criteria of the test protocol and ISO 10993-5 guidelines

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