BIO ECHO Life Sciences

EchoLUTION™

Buccal Swab DNA Kit

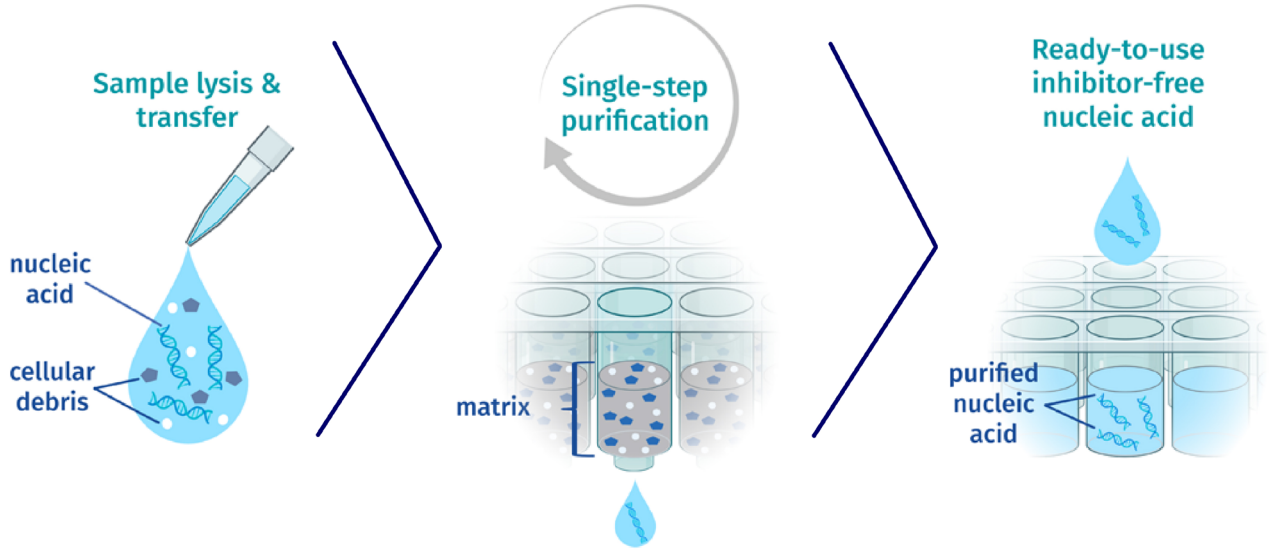
Ultra-fast and efficient DNA extraction from buccal swab samples

The Nucleic Acid Experts.

Ultra-fast and efficient DNA extraction from buccal swab samples

Genomic DNA from buccal swab samples is used as a non-invasive method to extract DNA for high-throughput genetic screening. This molecular analysis requires effective nucleic acid isolation to obtain DNA from numerous samples. The EchoLUTION Buccal Swab DNA Kit provides an ultra-fast extraction method, with a tailored lysis step within 2–5 minutes, followed by a single-step purification. The kit delivers high-quality DNA from dry swabs suitable for PCR testing, genetic sequencing, and other analyses like STR (short tandem repeat) and parental testing. Further applications are genotyping and disease assessment for livestock, poultry, farm animals, and pets.

The EchoLUTION™ Technology

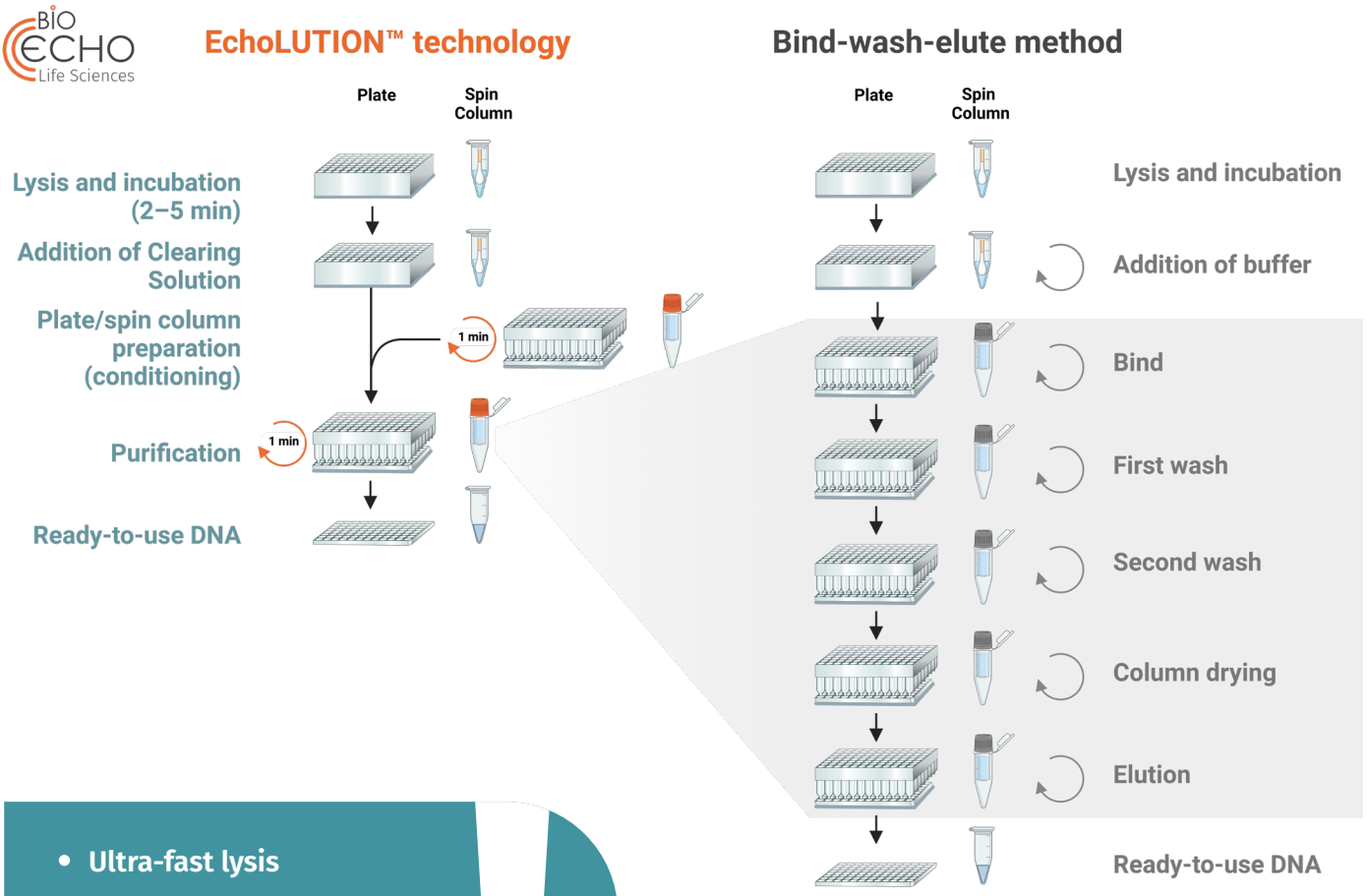


The EchoLUTION™ Buccal Swab DNA Kit provides:

Convenience and speed	Ultra-fast lysis combined with a single-step purification allows extraction of 96 samples within 15 minutes after swab handling.
High compatibility	Suitable with various dry swabs like Sarstedt® Forensic Swabs, Whatman® OmniSwabs, Copan dry eSwabs®, and Isohelix swabs.
High sensitivity	Highly pure DNA free of contaminants and inhibitors
Reliable results	DNA fragments perfectly suited for downstream applications such as PCR, sequencing, and STR (short tandem repeat) analysis
Sustainability	Up to 70 % less plastic consumption due to reduction of extraction steps and use of alternate packaging material

The workflow: faster and fewer steps

The EchoLUTION Buccal Swab DNA Kit is intended for ultra-fast and efficient DNA extraction. High-quality DNA with excellent DIN (DNA integrity number) can be obtained in spin column and plate formats, providing ready-to-use DNA for downstream applications without further processing.



- Ultra-fast lysis
- Half the hands-on time
- Single-step purification

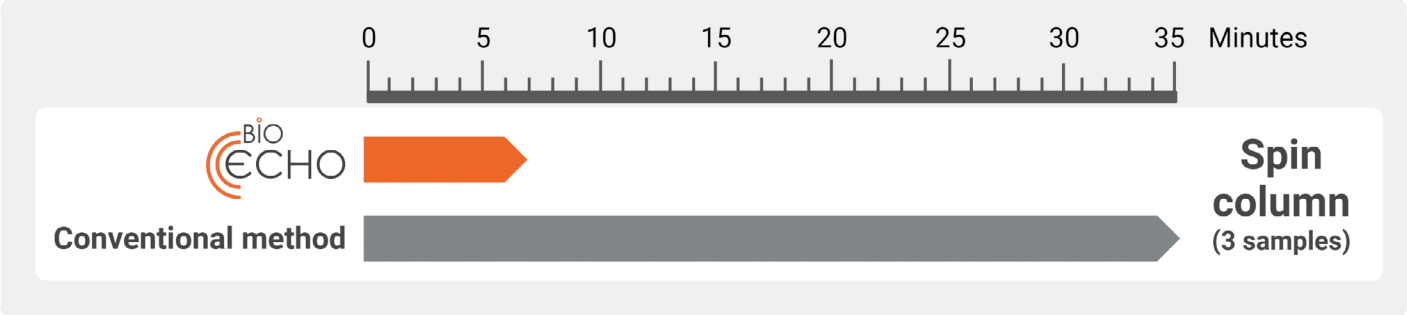
Lysis and transfer

The ultra-fast lysis reaction inactivates nucleases and stabilizes the nucleic acids in a 2- (spin column) or 5-minutes (plate) incubation period.

1. **Single-step purification**
   Once the lysate is transferred onto the spin column, it is purified with a one-minute centrifugation step. The DNA passes through the purification matrix without further interaction while impurities and cellular debris are held back and removed.

2. **Ready-to-use DNA**
   This innovative technology provides ready-to-use DNA for downstream applications.

Considerably faster compared to conventional methods



The EchoLUTION Buccal Swab DNA kit from BioEcho is much faster than a traditional kit. For spin columns, it is up to 5x faster than conventional methods.

Get high DNA concentration and yield

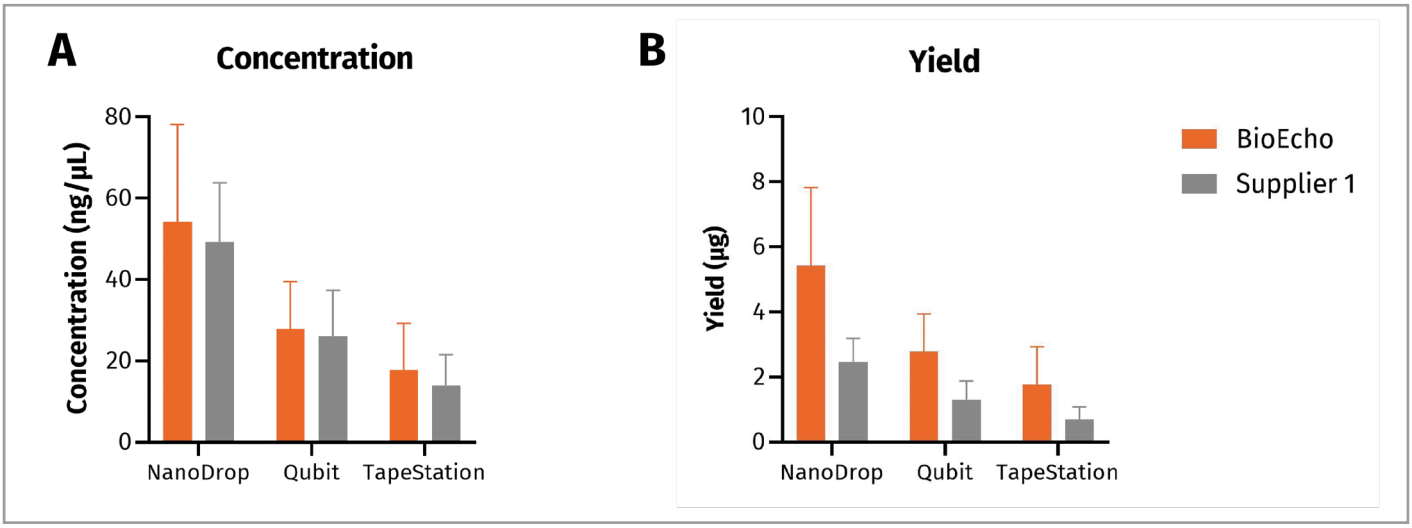


Figure 1. High DNA concentration and yield with the EchoLUTION Buccal Swab DNA Kit. A. Data show that DNA concentration obtained with the EchoLUTION Buccal Swab DNA Kit is comparable to a silica-based method. **B.** Mean DNA yields achieved with EchoLUTION Buccal Swab DNA Kit are higher than the ones obtained with a silica-based kit. Data analyzed with NanoDrop™, Qubit™, and TapeStation®. Error bars represent the standard deviation; high deviations are due to variability between individual subjects. N = 7 independent biological replicates

Comparable purity and higher DNA integrity with EchoLUTION™

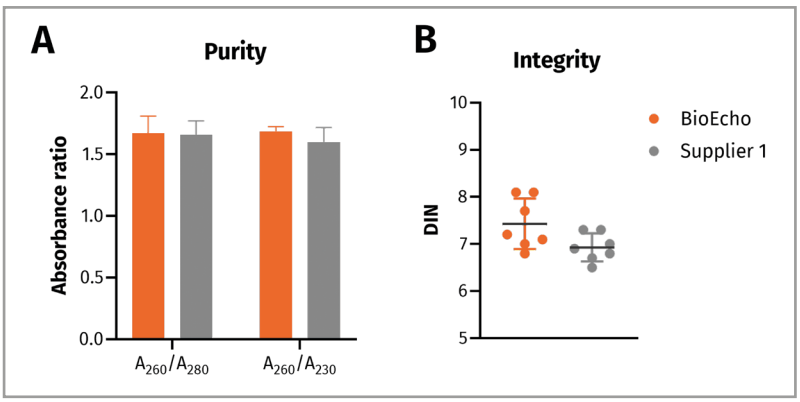


Figure 2. Evaluation of the DNA quality obtained with the EchoLUTION Buccal Swab DNA Kit and a silica-based kit, respectively. A. The absorbance ratios indicate that the purity of the extracted DNA is comparable between both methods. **B.** The DNA integrity analysis shows bigger fragment sizes (expressed as DIN) obtained with the EchoLUTION Buccal Swab DNA Kit as compared to another vendor's kit. Data analyzed with TapeStation. Error bars represent the standard deviation. N = 7 independent biological replicates.

Competitive DNA for downstream applications

Short tandem repeat (STR) analysis

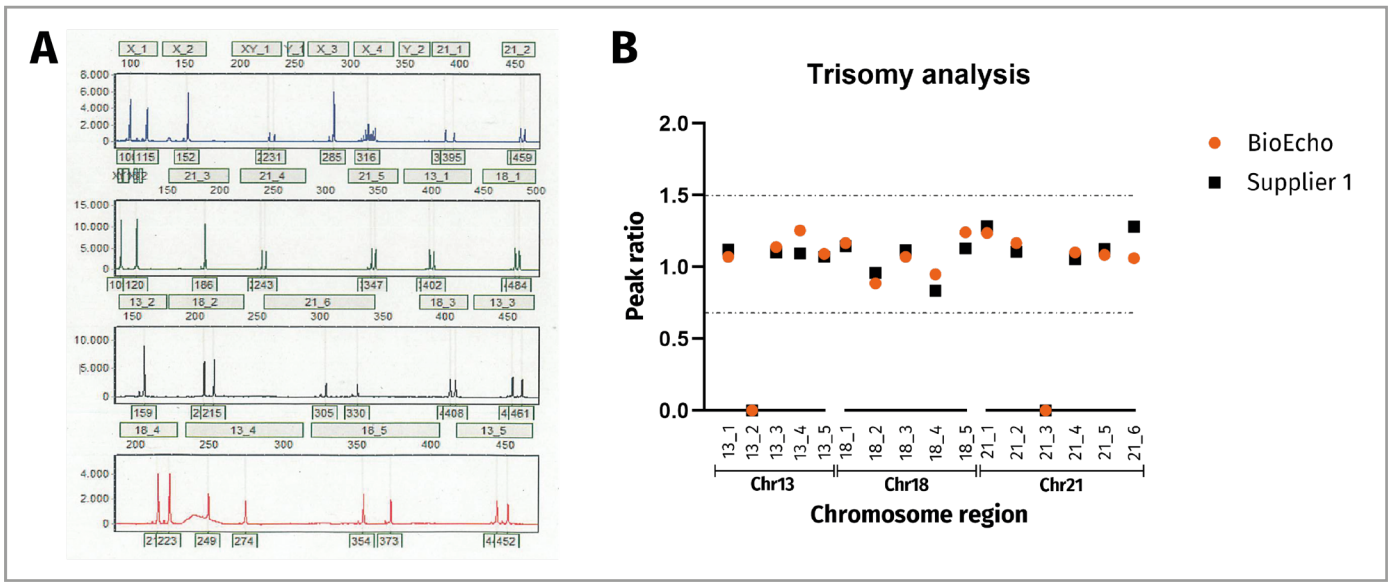


Figure 3. The EchoLUTION Buccal Swab DNA Kit provides high-quality DNA for STR analysis. A. QF-PCR (quantitative fluorescent-polymerase chain reaction) results. The X-axis represents the fragment length, and the Y-axis is the peak value for each locus in chromosomes X, Y, 13, 18, and 21. **B.** To assess two different methods, the DNA extraction was performed with the EchoLUTION Buccal Swab DNA Kit and a silica-based kit. Data demonstrate that results are comparable. The figure depicts a trisomy analysis based on the allele peak ratio from the analyzed loci in chromosome 13, 18, and 21. Each symbol represents the mean of two replicates. Ratios lying between 0.7 to 1.5 indicates that there are two copies of the allele, and they are heterozygous. We represent homozygous alleles as ratio = 0. A trisomy is considered when the ratio is < 0.70 or > 1.50. No trisomy was observed in this patient. We obtained similar results for additional four patients (data not shown).

Specifications at a glance

Sample input:
Buccal cells from 1 dry buccal swab

Processing:
Manual through centrifugation

Expected yield:
1–3 µg

Elution volume:
Up to 100 µL

Ordering information

Product	Quantity	Product no.
EchoLUTION Buccal Swab DNA Kit (50) EchoLUTION Buccal Swab DNA Kit (250)	50 rxn 250 rxn	010-010-050 010-010-250
EchoLUTION Buccal Swab DNA Kit (2 × 96) EchoLUTION Buccal Swab DNA Kit (8 × 96)	2 × 96 rxn 8 × 96 rxn	010-110-002 010-110-008
Conditioning Plates*	2 plates 8 plates	060-001-002 060-001-008
BioEcho Cap Puncher**	1 piece	050-001-001

*For sustainability reasons, Conditioning Plates are not included in our kits; these plates are reusable and can be purchased separately.

**Optional, for convenient handling of spin columns.

Compared to our previously established silica method, the EchoLUTION Buccal Swab DNA Kit showed a significantly better DNA yield and improved performance in PCR genotyping. Additionally, we were very impressed with the speed and simplicity of the methodology. We will continue using the EchoLUTION Buccal Swab DNA Kit for our DNA extraction.

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