



Collecting samples for genome and exome sequencing

How to collect and preserve blood, tissue, swabs and cell samples so the DNA is intact and pure enough for whole genome, resequencing, exome or mitogenome sequencing.

Good genome data starts with intact, pure DNA. Aim for:

Target	Why
High molecular weight (above 20 kb)	Needed for long reads; better libraries for short reads
A260/280 about 1.8, A260/230 at least 2.0	Prevents library and sequencing failures
No degradation	Even genome coverage
Enough DNA (usually 1–2 µg)	Long-read work needs more than short-read work

A. Blood (animals or humans)

- Collect 1–5 mL whole blood in **EDTA tubes** (not heparin, which inhibits PCR).
- Keep at 4 °C and extract within 24 hours, or freeze at –80 °C. Stabilising tubes (for example PAXgene) help in the field.
- Handle gently to avoid haemolysis; do not freeze before separation if you need plasma.

B. Tissue (liver, muscle, brain, leaves and others)

- Collect 25–50 mg with sterile tools; preserve as quickly as possible after dissection.
- Snap-freeze in liquid nitrogen and store at –80 °C, or place in a preservative such as RNAlater, DNA/RNA Shield or AllProtect.
- Use separate sterile tools for each sample to avoid cross-contamination.

C. Buccal swabs and saliva

- Use DNA-stabilising swabs or saliva kits (for example Oragene); swab the inner cheek for 30–60 seconds.
- No food or drink 30 minutes before. Stabilised kits keep at room temperature for weeks; dry plain swabs well or freeze at –20 °C.

D. Cell cultures and microbes

- Harvest cells by centrifugation (for example 1 million cells); for microbes, use a fresh plate or broth culture.
- Store pellets at –80 °C. Choose a lysis method suited to the cell wall (Gram type, fungi).

DNA extraction tips

- Use methods made for high-molecular-weight DNA (phenol–chloroform, MagAttract, Nanobind). For long reads, avoid column kits, which can shear DNA.
- Do not vortex or pipette up and down hard.

- Measure concentration with Qubit and purity with NanoDrop; check size on an agarose gel or TapeStation.

Common problems

Problem	Cause	Prevention
Degradation	Nucleases, slow processing	Freeze at once or use a stabilising buffer
Low yield	Small sample, poor lysis	Enough starting material; suitable method
Sheared DNA	Rough handling	Gentle pipetting, no vortexing
RNA or protein present	Incomplete purification	RNase and proteinase K steps
Inhibitors	Phenol, salts, heparin	Ethanol precipitation or clean-up

Checklist

- ✓ Sterile gloves, tubes and tips
- ✓ Collection tools (scalpel, syringe, swab) and a stabilising buffer or dry ice
- ✓ Record for each sample: ID, date, time, location and sample type
- ✓ Freeze or deliver to the lab without delay

Human samples need ethics approval and donor consent. Label tubes with codes, never with names.

Questions before sending samples? WhatsApp / phone +880 1308-222824 · bdgenome@yahoo.com · bdgenomes.com/guides/wgs-dna-samples/