

SwiftX™ Blood Genomic

(REF: SXBG-100)

Instructions for Use

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Intended use

SwiftX™ Blood Genomic is intended to be used for manual extraction of human and animal genomic DNA from anticoagulated as well as untreated blood samples. For research use only.

The extracted DNA samples can be applied to a wide range of analytical methods, such as spectrophotometric and fluorometric analyses, real-time quantitative PCR, isothermal amplification, capillary electrophoresis, microarray analysis, and next-generation sequencing.

Principles of the method

SwiftX™ Blood Genomic is designed for rapid extraction of genomic DNA of blood retrieved from humans or animals. Blood samples can be both treated with commercial anticoagulants and untreated such as from finger pricks.

The different components of SwiftX™ Blood Genomic have specific functionalities within the workflow of DNA extraction.

Buffer BGC rapidly lyses red blood cells (RBC, erythrocytes) while keeping white blood cells (WBC, leukocytes) intact. Furthermore, it provides optimal conditions for binding WBC to the paramagnetic particles Beads A.

Buffer BGW stabilizes the WBC bound to Beads A and promotes the removal of other contaminants.

Buffer BGL enables efficient lysis of white blood cells. In addition, it fosters removal of RNA as well as other cell constituents such as proteins during the reverse purification step at the end of the extraction procedure.

Beads A are paramagnetic particles with fast and strong magnetic response. They are used to capture and concentrate white blood cells from whole blood samples. After cell lysis, Beads A are utilized for our unique process called reverse purification, which leads to removal of cell debris and other particulate matter from the lysis mixture.

Content of the kit

Buffer BGC

Buffer BGW

Buffer BGL

Beads A

Equipment to be provided by the user

For performing the nucleic acid extraction procedure, the following laboratory equipment is required and needs to be provided by the user:

- Appropriate personal protective equipment
- Pipets and disposable pipet tips (aerosol barriers recommended)
- 1.5mL and 2mL microcentrifuge tubes (safe-lock-caps or screw-caps recommended)
- Magnetic stand (Xpedite Diagnostics REF: MAG-12)
- Vortexer (Xpedite Diagnostics REF: VOR-01)
- Heating block (Xpedite Diagnostics REF: ACC-15)
- Mini spin centrifuge (Xpedite Diagnostics REF: CEN-01)

Storage and shelf life

SwiftX™ Blood Genomic kits must be stored at 2 °C to 8 °C. Reagents are good to be used until the expiry date indicated on the label. Do not use reagents after their indicated expiry date.

After first use, SwiftX™ Blood Genomic kits are good to be used within 3 months.

Warnings and precautions

SwiftX™ Blood Genomic comprises of 3 buffers and paramagnetic particles. All components of the kit are free of hazardous substances. The safety data sheets (SDS) for SwiftX™ Blood Genomic components are available upon request.

Take care when working with biological samples and always treat them as potentially infectious. Users are advised to always wear appropriate personal protective equipment.

Be aware that the sample mixture remains potentially infectious until the heat lysis is conducted. Consequently, supernatants of cell capturing and washing steps must be treated as such.

Nucleic acid extracts can be disposed of with regular laboratory waste. Please take your national regulations for waste sorting and treatment into consideration.

Make sure to work with clean equipment and use pipette tips with aerosol barriers to avoid carryover of specimens or nucleic acid extracts between samples.

Sample types and their collection, handling, and storage

Venous whole blood should be collected using sterile equipment according to established phlebotomy procedures. SwiftX™ Blood Genomic was validated for venous whole blood (anti-coagulants K₂ EDTA, Na₃ Citrate, and Lithium Heparin), frozen blood, and capillary (finger prick blood).

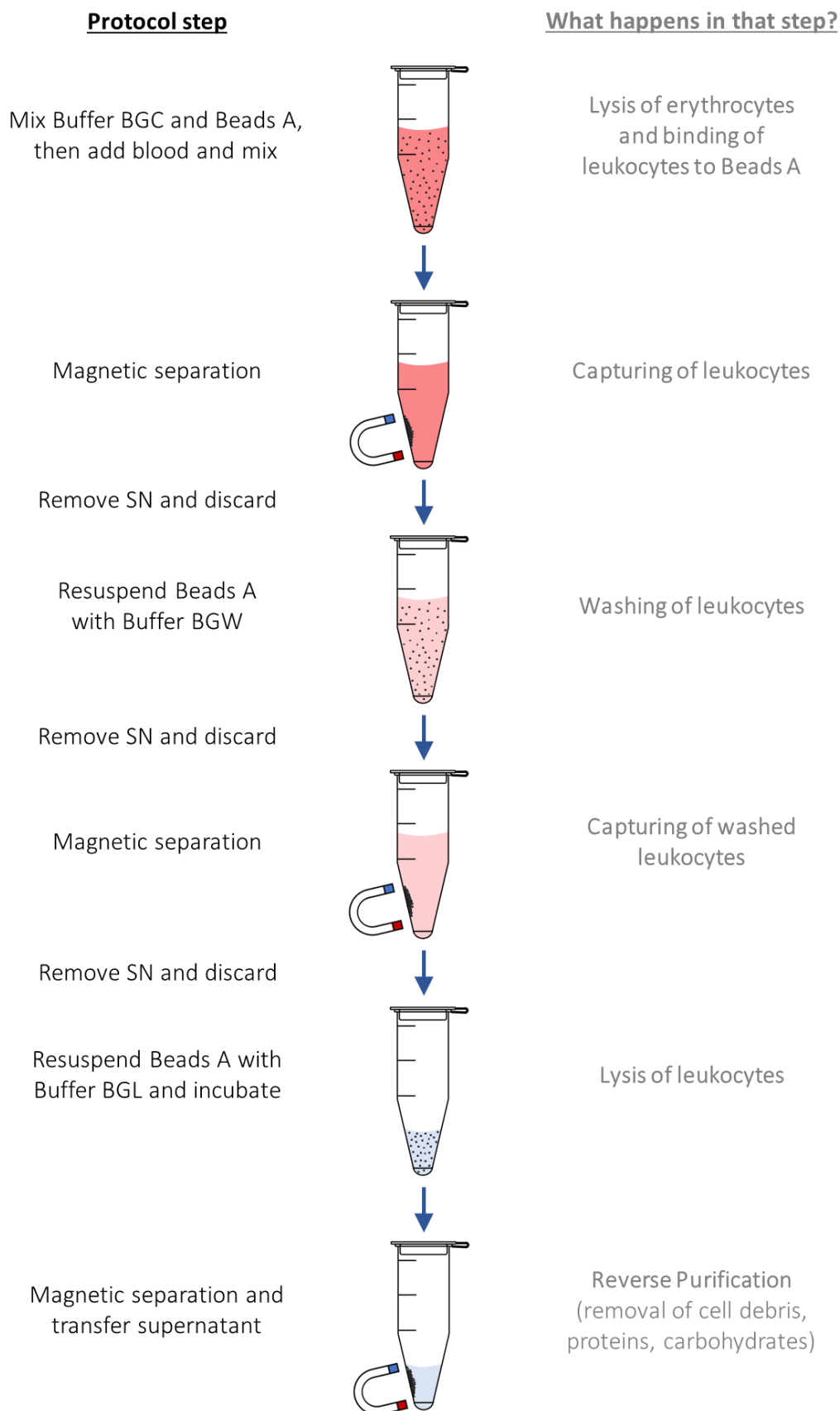
If venous blood samples are not immediately processed, they should be stored at 4°C and be processed within a week. Genomic DNA can also be extracted from frozen blood samples, although the yield of DNA might be slightly reduced compared to blood stored at 4°C.

Capillary blood samples such as from a finger prick should be extracted immediately after sampling to avoid coagulation of the sample.

The optimal **sample input volume** is 200µL of whole blood. However, the user can process as little as 5µL to up to 500µL of whole blood.

The standard **elution volume** is 100µL but can be chosen as low as 20µL according to the user's requirements.

Graphical representation of the extraction procedure



Step-by-step protocol for DNA extraction

To do before starting

- Set the heating block to 95 °C.
- Shake or vortex Beads A for 30 seconds to homogenize the particle suspension.

1. **Add 400 µL of Buffer BGC and 10 µL of Beads A to a 1.5 mL microtube with safe lock-cap.**
2. **Add 200 µL of blood sample and mix well by pipetting up and down or by vortexing for 5 seconds. Ensure that no liquid is resting at the tube lid.**

Note: The sample volume can be chosen from 5µL to 500µL. Always use twice the volume of Buffer BGC compared to the blood volume. Do not change the volume of Beads A (10µL).

3. **Incubate microtube at room temperature for 5 minutes.**
4. **Place microtube in a magnetic stand for 2 minutes.**
5. **Open the microtube while remaining in the magnetic stand. Remove and discard the supernatant by pipetting.**
6. **Add 400 µL of Buffer BGW and mix well by pipetting up and down or by vortexing for 2 seconds. Ensure that no liquid is sitting at the tube lid. Spin the tube briefly if necessary.**
7. **Place microtube in a magnetic stand for 1 minute.**
8. **Open the microtube while remaining in the magnetic stand. Remove and discard the supernatant by pipetting.**
9. **Add 100 µL of Buffer BGL to the microtube and resuspend the Beads A by vortexing for 5 seconds. Ensure all liquid is collected at the bottom of the tube.**

Note: For higher concentration of DNA, as little as 20µL Buffer BGL can be used.

10. **Incubate microtube in a heating block at 95 °C for 5 minutes.**
11. **Remove microtube from heating block and mix well for 2 seconds. Remove condensate from the lid by spinning the tube briefly.**
12. **Place microtube in a magnetic stand for 1 minute.**
13. **Do not remove the microtube from the magnetic stand! Use the supernatant directly for molecular analysis or transfer to a new microtube.**








Extracts can be stored for up to 7 days at 4 - 8 °C or up to 4 weeks at -20 °C.

Note: If DNA samples are not directly used, mix them by vortexing for 2 seconds before use.

Literature references

- Dairawan & Shetty (2020) Am J Biomed Sci & Res Article 8:39
- Ali *et al.* (2017) Biomed Res Int Article ID 9306564
- Schmitz *et al.* (2022) J Clin Microbiol 60: e0244621
- Kurkela & Brown (2009) Medicine 37: 535
- Liu *et al.* (2023) Mol Med Reports 27: 104

Key to symbols

	Catalog number
	Number of extractions
	Storage temperature
	Batch number
	Expiry date
	Read Instructions for Use
	Legal manufacturer

Legal manufacturer

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