

Manual

sbeadex Lightning Livestock DNA Kit

For Research Use Only. Not for use in diagnostic procedures.

Manual

sbeadex Lightning Livestock DNA Kit

Contents

1. Purpose of this document	3
2. Introduction to sbeadex Lightning chemistry	3
3. Kit contents and storage conditions	4
4. Experimental procedure	4
4.1 General information before starting	4
4.2 Required materials (not included)	4
4.3 Magnets and alternatives	5
4.4 Particle resuspension	5
4.5 Formation of precipitates in lysis buffer	5
4.6 Colouration of binding buffer and precipitates	5
4.7 Laboratory conditions	5
4.8 Starting material and storage	5
4.9 Lysis recommendations and preparation of lysates for binding reaction	6
4.10 Optimising input amount and lysis buffer volume	7
4.11 Mixing	7
5. sbeadex Lightning Livestock DNA kit short protocol	9
6. sbeadex Lightning Livestock DNA Kit protocols for sample lysis	10
6.1 Lysis Protocol A: Tissue (up to 30 mg per sample)	10
6.2 Lysis protocol B: hair	11
6.3 Lysis protocol C: Swab (dry), without preservation solution	11
6.4 Lysis Protocol D: swabs in preservation solution e.g. OraCollect from DNAGenotek	12
6.5 Lysis Protocol E: tissue in preservation solution e.g. Allflex, Caisley	13
7. sbeadex Lightning Livestock Kit protocol for DNA purification	14
8. Automation	15
8.1 oKtopure	15
8.2 KingFisher Flex	16
8.3 Other automation platforms	16
9. Troubleshooting	17
10. Further support	17

Manual

sbeadex Lightning Livestock DNA Kit

1. Purpose of this document

This user manual provides general information and detailed protocols for using the [sbeadex Lightning Livestock DNA Kit](#). We strongly recommend reading this manual thoroughly before first use to ensure optimal performance.

The manual includes comprehensive protocols for isolating high-quality DNA from various livestock samples. In addition, it provides guidance on how to modify the protocols to your specific needs and how to automate the kit on various automation platforms.

2. Introduction to sbeadex Lightning chemistry

sbeadex Lightning uses superparamagnetic microparticles and a novel binding mechanism that allows for simultaneous binding and washing of DNA. Combined with a single water washing step, this unique process removes unpleasant wash steps with hazardous ethanolic or highly chaotropic salt buffers. Impurities and potential inhibitors are efficiently removed leading to pure and high-quality DNA. sbeadex Lightning supplies clean, automatable purifications at the speed of crude extraction methods.

The sbeadex Lightning chemistry delivers nucleic acids of high yield, purity and quality that are suited for many downstream applications including PCR, quantitative PCR, sequencing, NGS and restriction analysis.

Traditional DNA purification



New sbeadex Lightning Livestock DNA Kit

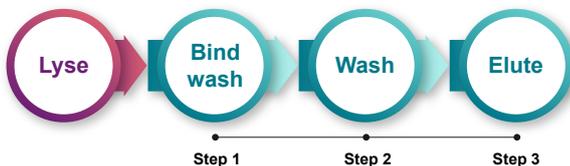


Figure 1. The shortened sbeadex Lightning workflow.

The upper workflow represents a typical magnetic bead-based DNA purification protocol. The lower workflow illustrates the innovative sbeadex Lightning protocol.

Manual

sbeadex Lightning Livestock DNA Kit

3. Kit contents and storage conditions

sbeadex Lightning Livestock DNA Kit

Component	NAP40-037-00 (10 preps*)	NAP40-037-01 (96 preps)	NAP40-037-02 (960 preps)	NAP40-037-03 (10,000 preps)	Storage conditions
Lysis buffer LSA	4 mL	44 mL	440 mL	4,400 mL	Room temperature
Protease K solution (20 mg/mL)	110 µL	1.1 mL	11 mL	110 mL	Room temperature
Binding buffer LLS	2.2 mL	22 mL	220 mL	2,200 mL	Room temperature**
sbeadex particle suspension	220 µL	2.2 mL	22 mL	220 mL	Room temperature
Elution buffer AMP	1.1 mL	11 mL	110 mL	1,100 mL	Room temperature

Table 1. Components supplied in the sbeadex Lightning Livestock DNA Kit, including details of component volumes by product code.

*This kit (10 preparations) is for testing purposes only and is not available for purchase via our web shop.

** If the buffer precipitates during shipment, please follow the instructions in section 4.6.

4. Experimental procedure

4.1 General information before starting

Livestock samples present a diverse set of challenges due to variability in tissue composition, sample origin, and potential contaminants that may interfere with downstream applications. These factors make it difficult to address all sample types with a single standardised protocol. The protocol, therefore, includes different lysis recommendations to address these challenges followed by a unified DNA purification protocol to offer a streamlined laboratory workflow.

The following sections provide detailed guidance on individual protocol steps to help you to adapt and fine-tune the procedure according to specific sample characteristics and customer needs.

4.2 Required materials (not included)

The list below details the equipment and reagents that are required to perform sbeadex Lightning nucleic acid purification in your laboratory, in addition to the reagents supplied with the kit.

Essential

- Magnetic rack, magnetic 96-well plate or centrifuge
- 96-well plates or reaction tubes
- Centrifuge
- Water bath or incubator (capable of temperatures up to 60 °C)
- Desalted or nuclease-free water (pH value below 7)

Manual

sbeadex Lightning Livestock DNA Kit

For processing tissue in preservation solution

- 10 mM Tris-HCl pH8, TE buffer pH8 or 1X PBS as a diluent (see section 6.5)

Optional

- [RNase A solution \(20 mg/mL\)](#)

4.3 Magnets and alternatives

When performing the sbeadex Lightning Livestock DNA kit protocol, a magnet or centrifuge is required to pellet the magnetic particles. Whilst use of magnets is recommended, if you are performing the protocol manually without access to a magnet, sample tubes can be centrifuged for 10 seconds at the highest possible speed to enable the magnetic particles to form a pellet.

4.4 Particle resuspension

It is important to ensure that the sbeadex particle suspension is properly re-suspended before adding it to the Binding buffer LLS for preparing a DNA binding premix or adding it directly to the samples. Using a non-homogenous sbeadex particle suspension will affect the efficiency of the purification chemistry, potentially resulting in lower nucleic acid yields and less uniform results.

4.5 Formation of precipitates in lysis buffer

Salt precipitates can form in the lysis buffer at low temperatures. Always check for the presence of precipitates prior to use. If precipitates have formed, incubate the buffer at 55 °C for 30 minutes, and shake thoroughly to re-dissolve the precipitates.

4.6 Colouration of binding buffer and precipitates

In Binding buffer LLS, colouration can occur over time. This is normal and does not impact performance. The binding buffer can also precipitate if storage conditions are too warm. This can be reversed by shaking and cooling the solution to 8 °C. Before using the binding buffer, ensure it is brought back to room temperature. Low amounts of precipitates will not affect performance. Moderate shaking of the binding buffer before usage is recommended.

4.7 Laboratory conditions

All processes are to be carried out at room temperature (15-25 °C) unless otherwise stated.

4.8 Starting material and storage

The sbeadex Lightning Livestock DNA kit is optimised for a wide variety of livestock sample types. Livestock samples can be processed fresh, frozen, dried, freeze-dried or in stabilisation solution.

Manual

sbeadex Lightning Livestock DNA Kit

4.9 Lysis recommendations and preparation of lysates for binding reaction

This kit includes a lysis buffer formulation that has been validated for effective performance across a wide range of livestock sample types. The protocol includes specific suggestions for certain sample types that are typically successful. However, for certain sample types optimising the lysis conditions may be necessary to achieve the best results. If DNA yield or purity falls below expectations, fine-tuning the lysis parameters can be beneficial.

Several factors influence lysis efficiency:

4.9.1 Lysis time

We recommend different lysis times for different sample types that are specified in the corresponding protocols. In some cases, and with difficult-to-lyse samples, extending the lysis time may improve results.

4.9.2 Lysis temperature

The optimal temperature for Protease K digestion is 55 °C. Note that the actual temperature within the sample may be lower than the set temperature on your heating device. If you are unsure whether your samples reach 55 °C during incubation, measure the temperature directly. If it is too low, increase the device settings to ensure optimal conditions.

4.9.3 Lysis buffer

The included Lysis buffer LSA is suitable for a broad spectrum of livestock samples. However, certain sample types may require alternative lysis buffers to efficiently release DNA and eliminate PCR inhibitors. LGC has developed a range of lysis buffers compatible with sbeadex Lightning chemistry. We offer a [sbeadex Lightning Starter Kit \(NAP40-032-00\)](#) containing six different lysis buffers, allowing you to tailor the lysis conditions to specific sample types if needed.

4.9.4 Protease K concentration:

The optimal concentration of Protease K solution (20 mg/mL) may differ depending on sample type and you can find suggestions for various sample types in the protocol section. In case yield or purity are lower than expected or sample is not fully lysed, increasing the final Protease K concentration may help to improve results.

For personalised guidance on optimising lysis conditions for specific sample types, please contact our technical support team at techsupport@lgcgroup.com.

Manual

sbeadex Lightning Livestock DNA Kit

4.9.5 RNase A digestion

If RNA removal is desired, we recommend treatment with RNase A. Please note that RNase A solution is not included in the kit (section 4.2). You may apply RNase A solution during overnight lysis, after overnight lysis for e.g. 10-30 minutes at 55 °C, or during the water-based wash step.

If using RNase A solution during (overnight) protease digestion, use 5 µL [RNase A solution](#) per 1 mL Lysis buffer LSA. Aside from incubation time in the presence of protease, please avoid prolonged exposure of RNase A to protease.

For RNase digestion during the water-wash step, apply 2 µL RNase A solution per reaction and process samples as described in section 7.2, but rest samples for at least 2 minutes at room temperature before proceeding to pelleting the beads and eluting the DNA from the beads.

4.10 Optimising input amount and lysis buffer volume

The required sample input amount and lysis buffer volume can vary depending on the type and condition of samples. Factors such as tissue type or moisture content (e.g. dry swabs) can significantly influence lysis efficiency and lysate clarity, as well as total lysis buffer volume required. Therefore, some optimisation may be necessary to achieve consistent DNA yield and quality. When working with a new sample type, we recommend adjusting the lysate volume accordingly to ensure optimal performance. Please ensure that you can transfer 200 µL of cleared lysate to the DNA binding step without carry-over of debris from the sample.

4.11 Mixing

Proper mixing of magnetic beads and the sample is crucial during DNA binding, washing and elution steps.

4.11.1 Vortexing

If processing samples manually, vortexing is one of the most efficient ways to properly mix during the DNA binding, wash and elution steps. We highly recommend applying constant vortexing of samples for indicated timepoints instead of pulse vortexing as outlined in the protocol (see section 6).

Manual

sbeadex Lightning Livestock DNA Kit

4.11.2 Mixing on a shaker in a multi-well plate

All protocol steps can be performed in a multi-well format. When using a shaker, we strongly recommend using deep-well plates to minimise the risk of cross-contamination during high-speed shaking. Before starting routine processing, it is advisable to establish and validate mixing parameters that ensure thorough and uniform mixing throughout the DNA binding, washing, and elution steps.

To test mixing efficiency and avoid cross-contamination, you can simulate the workflow using dyed water in a deep-well 96-well plate. This allows you to visually assess mixing performance and adjust speed or duration as needed.

Please note that mixtures containing sample lysate, Binding buffer LLS, and sbeadex particle suspension may exhibit higher viscosity and behave differently than water-based solutions. These mixtures may require modified mixing routines to achieve optimal results.

If you need assistance optimising your shaker-based mixing protocol, please contact our nucleic acid purification specialists (see contact information in section 10).

4.11.3 Pipette mixing

Alternatively, mixing by pipetting up and down can ensure proper mixing during DNA binding, wash and elution. If you encounter processing limitations such as high viscosity or bead clumping, please consider using wide-bore tips for mixing the samples. Please also consider optimising your input sample amount and lysis buffer volume as outlined in section 4.10.

Manual

sbeadex Lightning Livestock DNA Kit

5. sbeadex Lightning Livestock DNA kit short protocol

This section provides a condensed, one-page protocol intended for experienced users. If you are using the kit for the first time, we strongly recommend reading the full protocol in sections 6 and 7.

Sample lysis

	Tissue (A)*	Hair (B)*	(Dry) swabs (C)*, no preservation solution	Storage solution from swabs† (D)*	Tissue in preservation solutions (E)*
Lysis buffer LSA volume	200-400 µL	200-400 µL	300-400 µL	No additional lysis buffer	No additional lysis buffer
Protease K solution per sample	10 µL	10 µL	10 µL	10 µL	10 µL
Incubation at 55 °C	Overnight or until tissue is completely dissolved (optional: mixing or shaking)	1 hour	10 to 30 minutes	10 minutes	Overnight or until tissue is completely dissolved (optional: mixing or shaking)
Volume of lysate transferred into DNA binding reaction	200 µL lysate	200 µL lysate	200 µL lysate	200 µL lysate	50 µL lysate ^{††} + 150 µL 10 mM Tris-HCl pH8

Table 2. Short protocol summary table for sample lysis using sbeadex Lightning Livestock DNA kit.

*Detailed protocols A-E are described in section 6. † e.g. OraCollect from DNAGenotek™

†† e.g. Allflex or Caisley. Please note that, depending on sample type, an alternative volume of preservation solution might be applicable and might deliver optimal results.

NOTE: before proceeding to DNA binding, ensure to first homogenise the lysate thoroughly by vortexing. After homogenisation, pellet any remaining debris if needed. Ensure that clear lysate is transferred into DNA binding reaction.

DNA purification

Bind	200 µL cleared lysate ; 200 µL Binding buffer LLS ; 20 µL sbeadex particle suspension
	Mix by pipetting, vortex or shaking for 30 seconds; Let sample rest for 30 seconds
	Magnetic separation (typically 15 seconds to 1 minute); Remove supernatant
Wash	Remove from magnet, add 400 µL nuclease-free water
	Mix by pipetting, vortex or shaking for 30 seconds; Let sample rest for 30 seconds
	Magnetic separation (typically 15 seconds to 1 minute); Remove supernatant
Elute	Remove from magnet, add 50-100 µL Elution buffer AMP
	Mix by pipetting, vortex or shaking for 30 seconds; Incubate 1-3 minutes at 60 °C
	Mix by pipetting, vortex or shaking for 30 seconds
	Magnetic separation for 1 minute ; Transfer DNA eluate to fresh plate/tube

Table 3. Short protocol summary table for bind, wash and elute steps of the sbeadex Lightning Livestock DNA kit protocol.

Manual

sbeadex Lightning Livestock DNA Kit

6. sbeadex Lightning Livestock DNA Kit protocols for sample lysis

6.1 Lysis Protocol A: Tissue (up to 30 mg per sample)

NOTE: Before you start with the protocol, please ensure neither lysis buffer nor binding buffer contain any precipitates. To remove precipitates please follow instructions in section 4.5 and 4.6. Maximum input amount per sample may vary depending on tissue type. Please consider titration of input amount per sample for optimal results. Please also consider optimising lysis buffer volume per sample as described in 4.10.

- Add 200-400 μL of Lysis buffer LSA supplemented with 10 μL Protease K solution (20 mg/mL) to each tissue sample.

NOTE: A premix of lysis buffer and Protease K solution is stable for 24 hours at room temperature.

NOTE: If your downstream application is sensitive to RNA carry-over, an RNA digestion with RNase A may be beneficial to efficiently remove total RNA from your samples. We suggest using 5 μL of RNase A solution per 1 mL of Lysis buffer LSA. Please note that RNase A solution is not included in the kit. For ordering information please refer to section 4.2 and for further recommendations for RNase A digestion please refer to section 4.9.5.

NOTE: Depending on the amount of sample and the type, lysis buffer volume may be adapted. Ensure that you can transfer 200 μL of cleared lysate after the lysis. Please see section 4.10 for recommendations on lysis buffer volumes.

- Incubate the sample at 55 °C overnight or until tissue is dissolved.

NOTE: Depending on sample type, lysis time may be shortened or prolonged (please refer to section 4.9.1 for more details).

NOTE: Mixing or periodic mixing can be beneficial for an efficient lysis.

- After the incubation, homogenise lysate by thoroughly mixing or vortexing. If debris is present after homogenisation, centrifuge sample at maximum speed for 1 minute to pellet the debris and to ensure transfer of cleared lysate into DNA binding reaction.
- Proceed with the purification protocol in section 7.

Manual

sbeadex Lightning Livestock DNA Kit

6.2 Lysis protocol B: Hair

- Add 200-400 μL of Lysis buffer LSA supplemented with 10 μl Protease K solution (20 mg/mL) to each hair sample and mix thoroughly.

NOTE: A premix of lysis buffer and Protease K solution is stable for 24 hours at room temperature.

NOTE: If your downstream application is sensitive to RNA carry-over an RNA digestion with RNase A may be beneficial to efficiently remove total RNA from your samples. We suggest using 5 μL of RNase A solution per 1 mL of Lysis buffer LSA. Please note that RNase A solution is not included in the kit. For ordering information please refer to section 4.2 and for further recommendations for RNase digestion please refer to 4.9.5.

NOTE: Depending on the amount of sample and the type, lysis buffer volume may be adapted. Ensure that all hair roots are submerged in lysis buffer and that you can transfer 200 μL of cleared lysate after the lysis. Please see section 4.10 for recommendations on lysis buffer volumes.

- Incubate the sample at 55 °C for 60 minutes.

NOTE: Depending on sample type, lysis time may be shortened or prolonged (please refer to section 4.9.1 for more details).

NOTE: Mixing or periodic mixing can be beneficial for an efficient lysis.

- After the incubation, homogenise lysate by thoroughly mixing or vortexing. After homogenisation, centrifuge sample at maximum speed for 1 minute to pellet the remaining hair and debris and to ensure transfer of cleared lysate into DNA binding reaction
- Proceed with the purification protocol in section 7.

6.3 Lysis protocol C: Swab (dry), without preservation solution

- Add 300-400 μL of Lysis buffer LSA supplemented with 10 μL Protease K solution (20 mg/mL) per reaction to each swab and mix thoroughly.

NOTE: A premix of lysis buffer and Protease K solution is stable for 24 hours at room temperature.

NOTE: If your downstream application is sensitive to RNA carryover, an RNA digestion with RNase A may be beneficial to efficiently remove total RNA from your samples. We suggest using 5 μL of RNase A solution per 1 mL of Lysis Buffer. Please note that RNase A solution is not included in the kit. For ordering information please refer to section 4.2. and for further recommendations for RNase digestion please refer to 4.9.5.

Manual

sbeadex Lightning Livestock DNA Kit

NOTE: Depending on the amount of sample and the type, lysis buffer volume may be adapted. Ensure that the swab is completely submerged in lysis buffer and that you can transfer 200 µL of cleared lysate after the lysis. Please see section 4.10 for recommendations on lysis buffer volumes.

- Incubate the sample at 55 °C for 10-30 minutes.

NOTE: Depending on sample type lysis may be shortened or prolonged (please refer to section 4.9.1 for more details).

NOTE: Mixing or periodic mixing can be beneficial for an efficient lysis.

- After the incubation, homogenise lysate by thoroughly mixing or vortexing. If debris is present after homogenisation, centrifuge sample at maximum speed for 1 minute to pellet the debris and to ensure transfer of cleared lysate into the DNA binding reaction
- Proceed with the purification protocol in section 7.

6.4 Lysis Protocol D: Swabs in preservation solution e.g. OraCollect from DNAGenotek

- Mix or invert sample tubes thoroughly.
- Transfer up to 200 µL of preservation solution from the sample tube into a fresh tube or plate.
- Add 10 µL Protease K solution (20 mg/mL) per sample and mix thoroughly. Incubate the sample at 55 °C for 10 minutes.

NOTE: Depending on sample type, lysis time may be shortened or prolonged (please refer to section 4.9.1 for more details).

NOTE: Mixing or periodic mixing can be beneficial for an efficient lysis.

NOTE: After the incubation, homogenise lysate by thoroughly mixing or vortexing. If debris is present after homogenisation, centrifuge sample at maximum speed for 1 minute to pellet the debris and to ensure transfer of cleared lysate into DNA binding reaction.

- Proceed with the purification protocol in section 7.

Manual

sbeadex Lightning Livestock DNA Kit

6.5 Lysis Protocol E: Tissue in preservation solution e.g. Allflex, Caisley

- Add 10 µL Protease K solution (20 mg/mL) to the preservation tube and mix.

NOTE: If your downstream application is sensitive to RNA carry-over an RNA digestion with RNase A may be beneficial to efficiently remove total RNA from your samples. We suggest using 5 µL of RNase A solution per 1 mL of Lysis Buffer. Please note that RNase A solution is not included in the kit. For ordering information please refer to section 4.2 and for further recommendations for RNase digestion please refer to section 4.9.5.

- Incubate the sample at 55 °C overnight.

NOTE: Depending on sample type, lysis time may be shortened or prolonged (please refer to section 4.9.1 for more details).

NOTE: Mixing or periodic mixing can be beneficial for an efficient lysis and to avoid extensive viscosity.

- After the incubation, homogenise lysate by thoroughly mixing or vortexing. After homogenisation, centrifuge sample to pellet any debris if needed to ensure transfer of cleared lysate into DNA binding reaction.
- Transfer 50 µL clear lysate to 150 µL 10 mM Tris-HCl pH8 (alternative buffers: TE-buffer pH 8 or 1X PBS).
- Proceed with the purification protocol in section 7.

Manual

sbeadex Lightning Livestock DNA Kit

7. sbeadex Lightning Livestock DNA Kit protocol for DNA purification

7.1 Bind

- Add 200 μ L of Binding buffer LLS and 20 μ L of sbeadex particle suspension to a fresh tube or well.

NOTE: Ensure the sbeadex particle suspension is well mixed before use.

NOTE: A pre-mix of Binding buffer LLS and sbeadex particle suspension is stable for at least one month at room temperature.

- Transfer 200 μ L of the cleared lysate to the binding mix.
- Vortex for 30 seconds and allow to rest for 30 seconds at room temperature.

NOTE: Thorough mixing is essential for optimal performance. For manual processing, we recommend vortexing, though pipette or shaker-based mixing can also be used. Please refer to section 4.11 for guidance on suitable mixing methods.

- Bring magnet into contact with the tube or wells until all sbeadex particles form a pellet (usually 15-60 seconds depending on sample type; higher DNA loads require longer times for bead pelleting).
- Remove the supernatant and discard. Remove as much supernatant as possible without dislodging the bead pellet.

7.2 Wash

- Separate magnet from the tubes or plate and add 400 μ L of nuclease-free water.

NOTE: Ensure that desalted or nuclease-free water with a pH value below 7 is used.

- Vortex for 30 seconds and allow to rest for 30 seconds at room temperature.
- Bring magnet into contact with the tube or wells until all sbeadex particles form a pellet (usually 15-60 seconds depending on sample type).
- Remove the supernatant and discard. Remove as much supernatant as possible without dislodging the bead pellet.

7.3 Elute

- Separate the magnet from the tubes or wells and add 50-100 μ L of Elution buffer AMP.
- Vortex for 30 seconds, incubate for 1-3 minutes at 60 °C and vortex for another 30 seconds.

Manual

sbeadex Lightning Livestock DNA Kit

NOTE: Depending on the sample type and mixing mode, elution time and requirement for heated incubation may differ. In general, a 1-3 minute elution time is sufficient but very high molecular weight DNA samples may require prolonged heated incubation for efficient elution (5-10 minutes at 60 °C).

NOTE: To obtain more highly concentrated DNA, elution buffer volume can be reduced to 20 µL.

- Bring magnet into contact with the tube or wells until all sbeadex particles form a pellet (usually 15-60 seconds depending on sample type).
- Transfer the DNA eluate to a new tube or plate.

8. Automation

Before transitioning to automation, we strongly recommend performing the sbeadex Lightning protocol manually to ensure it is fully optimised for your specific sample type. This step helps to establish a reliable baseline and allows for fine-tuning of critical parameters.

When automating the protocol, we advise starting with the same reagent volumes that proved to be effective during manual extraction. This approach supports consistency and facilitates troubleshooting during the initial automation phase.

Biosearch Technologies have decades of experience in automating nucleic acid extraction. Our R&D facilities are equipped with a wide range of automation platforms, and our team is ready to support your automation project with expert guidance. We are committed to helping you implement our chemistry in a way that aligns with your workflow and performance goals.

Additionally, we offer pilot studies and protocol customisation services to meet your specific requirements.

The sbeadex Lightning Kit is suitable to be automated on any liquid handler capable of handling magnetic bead-based kits as well as on magnetic rod automation platforms. In the following sections we provide some guidance for a selection of platforms.

8.1 oKtopure

The oKtopure™ (Biosearch Technologies) is a fully automated nucleic acid isolation platform that combines high-throughput automation with our proprietary sbeadex purification chemistry for high-quality and high-yield DNA purification. Full details about this platform can be accessed on our [website](#).

We offer standard scripts for our oKtopure platform that can be downloaded [here](#). We recommend adapting the protocols to the respective sample material and the lysate volume used.

If you need support to implement the sbeadex Lightning Livestock DNA Kit on our oKtopure or further information on the system, please contact our technical support team (see section 10).

Manual

sbeadex Lightning Livestock DNA Kit

8.2 KingFisher Flex

For a flexible, medium-to-low throughput automation, the KingFisher™ Flex Purification System (ThermoFisher Scientific Inc.) can provide a sufficient solution. To streamline your workflow, we provide standard automation scripts for the sbeadex Lightning Livestock DNA Kit on the KingFisher Flex system. These scripts support multiple elution time options, allowing easy adjustment for various sample types.

Thanks to the simplicity of the sbeadex Lightning chemistry, which requires only three positions on the KingFisher (Bind, Wash, Elute), our automation setup also enables high-throughput processing of 2 × 96 samples in a single run.

For specialised needs, we offer custom scripts with scaled-down buffer volumes upon request. Please contact our technical support team (see section 10) for assistance.

All standard scripts are available for download via the following link:

- [KingFisher Flex scripts for sbeadex Lightning Livestock DNA Kit](#)

Each script is supplied together with a protocol report that provides additional details on buffer volumes and plate positions to support optimal setup and usage.

If protocol adjustments are necessary, please keep the following guidelines in mind:

1. Keep all volumes the same as for manual nucleic acid isolation. Longer elution times with heat might cause evaporation (e.g. for a 10-minute elution we recommend 20 µL additional elution buffer).
2. The incubation period for each bind and wash step should be a minimum of 1 minute to account for diffusion-dependent wash effects. Elution should be carried out at 70 °C for 1-10 minutes.
3. Prior to mixing for the washing and elution step, use the 'Release Beads' function with a 'bottom mix' for 10 seconds. Automated mixing should then be performed using the 'Fast' setting.

8.3 Other automation platforms

In general, the sbeadex Lightning Livestock DNA kit is compatible with other liquid-handler DNA purification platforms (e.g. Hamilton, Opentrons®, Beckman Coulter®, Dynamic Devices, Analytic Jena® or Tecan®).

When establishing protocols, please do not hesitate to contact our nucleic acid specialists (see section 10) for guidance and support.

Manual

sbeadex Lightning Livestock DNA Kit

9. Troubleshooting

Problem	Solution suggestion
Low yield	<p>Multiple factors can affect low yield. Please see the list of solution suggestions below.</p> <p>Lysis</p> <p>Incomplete lysis may lead to low yields.</p> <ul style="list-style-type: none">• Check the lysis buffer for precipitation. See section 4.5.• Look to optimise the lysis by modifying the lysis time and temperature.• Ensure that the sample and lysis buffer are properly mixed.• Look to optimise the lysis buffer volume added to the sample to ensure complete lysis.• Ensure stringent homogenisation of lysates prior to transfer into DNA binding reaction especially in case of extensive lysate viscosity.• Ensure that the correct volume of lysate is transferred into DNA binding reaction. When using multichannel pipettes or automating the process, pipette tips may clog due to viscous lysates or debris. In such cases, we recommend using wide-bore tips for the lysate transfer to prevent blockages and maintain consistency.• Certain sample types may require distinct lysis buffers. To support this, we offer the sbeadex Lightning Starter Kit, which includes six different lysis buffer options. This kit allows you to evaluate whether an alternative buffer improves lysis performance for your specific samples. <p>Elution</p> <p>Incomplete elution can lead to low yields.</p> <ul style="list-style-type: none">• Optimise the DNA elution by increasing the elution time, increase the elution temperature and add a mixing step by the end of heated incubation.
Low concentration	<p>In addition to the factors relating to yield, the following can affect the final concentration.</p> <p>Lysis</p> <ul style="list-style-type: none">• Optimise the lysis buffer volume added to the sample. Reducing the lysis buffer volume can increase the final DNA concentration. <p>Elution</p> <ul style="list-style-type: none">• Optimise the elution buffer volume to modify the final DNA concentration. A higher elution buffer volume may result in increased DNA recovery for a higher total DNA yield. A lower elution buffer volume may result in decreased DNA recovery but a higher final DNA concentration.
Low purity	<p>Lysis</p> <ul style="list-style-type: none">• Purity can be negatively affected by the transfer of debris during the lysate transfer. Ensure clear lysate is transferred into the DNA binding reaction and optimise the lysis buffer volume if needed.• The sbeadex Lightning Starter Kit contains six different lysis buffer options. These alternative lysis buffers may deliver higher DNA quality, particularly better DNA purity, for your respective material-of-interest. <p>Binding and washing</p> <ul style="list-style-type: none">• Make sure that the beads are fully mixed during the binding and washing steps. Please refer to section 4.11.• Ensure that the supernatants of DNA binding and wash step are fully removed after the magnetic separation steps.

10. Further support

If you require any further support for any of the sbeadex products, please contact our technical support team at techsupport@lgcgroup.com.



For Research Use Only. Not for use in diagnostic procedures.

X **f in** @LGCBiosearch | biosearchtech.com

All trademarks and registered trademarks mentioned herein are the property of their respective owners. All other trademarks and registered trademarks are the property of LGC and its subsidiaries. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or any retrieval system, without the written permission of the copyright holder. © LGC Limited, 2026. All rights reserved. GEN/1229/SW/0126

BIOSEARCH™
TECHNOLOGIES