



Automated extraction of high-quality DNA from tissue samples using sbeadex and oKtopure

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Introduction

The sbeadex™ tissue kit has been developed to extract high-quality genomic DNA from a wide variety of human and animal tissue materials. sbeadex is a magnetic bead-based extraction technology with a novel two-step binding mechanism via an adapter which allows binding

of nucleic acids more specifically. Final washes with pure water deliver nucleic acids with high yield, purity and quality. sbeadex chemistry is perfectly adapted to our automated, high-throughput extraction platform: the oKtopure™.

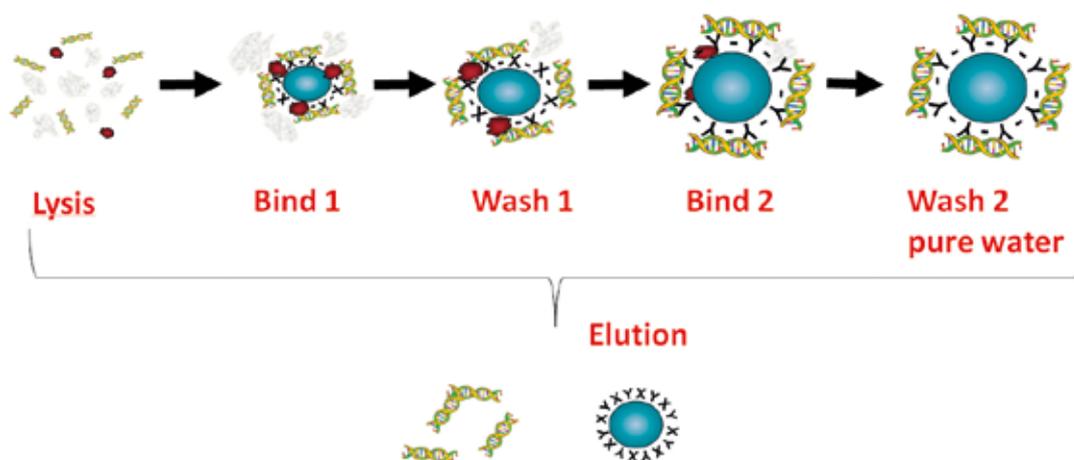


Figure 1: Unique, two-step binding mechanism of sbeadex particles, when in the presence of detergents and salts. Binding is followed by a final wash with water, after which purified DNA is released into elution buffer without requiring ethanol evaporation or a DNA drying step.

The oKtopure

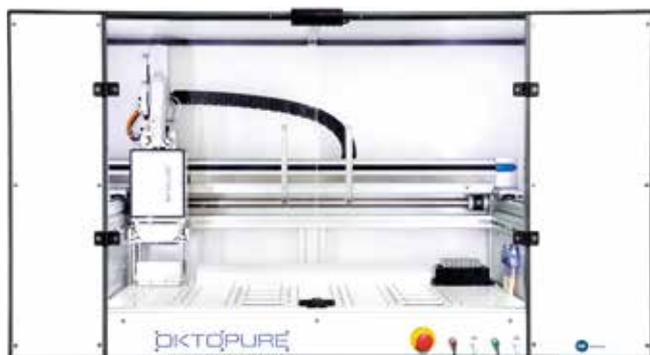


Figure 2: The oKtopure instrument

Benefits of oKtopure at a glance

- High-throughput and full 'walk-away' automation of sbeadex-based extractions
 - 8 x 96 plates / 2-2.5 hour for sbeadex tissue extractions (20-30 mg starting material)
- Efficient use of laboratory space
 - Small format: 170 cm x 68.5 cm x 65 cm
- Offline tip washing option drives reduced consumable costs through reuse of tips
 - Savings of up to 50%
- Compatible with existing SNPLINE installations

Example data: Automated DNA extraction from bovine tissue samples using the sbeadex tissue kit and the oKtopure

Protocol overview

- 6 x 20 mg of tissue was lysed in 300 μ L Lysis buffer TN (supplemented with 5 μ L Proteinase K (20 mg / ml)) with an overnight incubation at 55 $^{\circ}$ C;
- After centrifuging the samples briefly to remove debris, 200 μ L of the cleared lysate was transferred to a fresh tube and extracted using an oKtopure standard run program (~ 2 hours 50 minutes duration, equal to ~ 21 minutes per 96-well plate);
- Each sample was eluted in 60 μ L Elution buffer and the quantity and quality of the extracted DNA assessed.

Quantitative and qualitative analysis of extracted DNA samples

Sample ID	Concentration (ng / μ L)	260 / 280	260 / 230
1	137.4	1.76	0.98
2	108.3	1.75	0.97
3	127.2	1.76	1.22
4	103.0	1.84	1.80
5	104.5	1.86	1.87
6	119.8	1.88	2.08

Table 1: Quantification and purity measurements of bovine tissue DNA extracted using sbeadex chemistry on the oKtopure.

Product code

(NAP41440) sbeadex tissue oKtopure kit
(960 extractions)

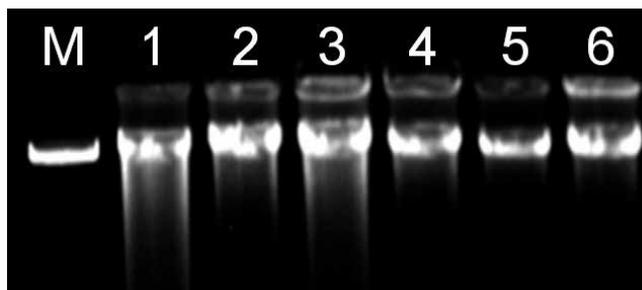


Figure 3: Agarose gel image of bovine tissue DNA extracted using sbeadex on the oKtopure. 8 μ L of each DNA sample was run on a 0.8 % agarose gel to check DNA integrity (M = 100 ng Lambda genomic DNA).

Our application team has had great success optimising the existing protocols and reagents to extract DNA from more challenging species, or to deliver DNA at a yield and quality that is specific to customers' downstream requirements.

Extractions validated from the following human tissue samples	Extractions validated from the following animal tissues
Heart	Mouse ear punch / mouse tails
Tumour	Chicken
Brain	Goat
Liver	Sheep
Biopsy	Pig
Skin samples	Fish fin clips

Table 2: Example of tissue sample types for which optimised protocols have been validated.

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