

Camselect NGS

Clean up and Size selection for genomics applications

Nucleic acid purification is a basic necessity in several sequence analysis consisting of nucleic acid fragments after shearing of the whole genome or post PCR amplification with undesirable molecules including DNTPs, primers, primer-dimers, enzymes and chaotropes. Sample preparation for sequencing involves removal of undesirable components (clean-up) and also removal of nucleic acid fragments which are not in the size range (size selection) ideal for downstream sequencing platforms. A size selective separation of nucleic acid sequences from aforementioned components is paramount to the success of various downstream applications including NGS. Most popular sequencing related sample preparation procedures include clean-up, left side selection, right side selection and double side selection.

The CamSelect NGS kit consists of an aqueous suspension of magnetic beads along with a specific polymer and inorganic salts. In the presence of polymer and the inorganic salt, the magnetic beads have size selective affinity towards nucleic acid based molecules including DNA and RNA, therefore allowing a reversible immobilisation of nucleic acid sequences above a certain threshold size. Subsequently, if the desired nucleic acid fragments were to be in the supernatant after magnetic separation of beads, then the supernatant could be used downstream applications. On the contrary, if the desired nucleic acid sequences were present on the magnetic beads after magnetic separation, then an elution step would desorb the bound nucleic acid

fragments. In this case, the resulting elute could be used for downstream sequencing applications. Overall, Camselect NGS works by selectively targeting nucleic acid sequences as a function of their sizes.

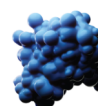


Repeatable performance

A robust quality system ensures uniformity in the critical characteristics of the functionalized magnetic particle with every batch manufactured. This ensured the repeatable, consistent performance of Camselect NGS. Quality associated particle characteristics include size and surface charge, which are measured using DLS, potentiometric titration and zeta potential measurement.

Camselect Size selection Beads

Particle composition	Fe ₃ O ₄ , SiO ₂ , Proprietary surface functionalisation
COOH content	> 0.5 μ moles/ml
Particle size	700 nm to 900 nm
Surface charge	-32 mV to -42 mV



Performance Data:

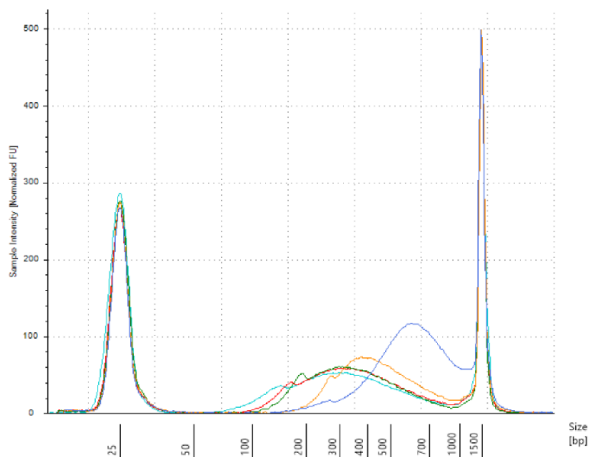
The below data summarises the left side selection performance of Camselect NGS. The data produced was obtained by using an Agilent Tapestation.

Left side selection

Genomic DNA was extracted from a whole blood sample, using a Qiagen DNeasy Blood and tissue kit with RNase treatment. The extracted DNA was sheared using Covaris-mediated hydrodynamic shearing. The concentration of the sheared DNA was estimated using Qubit and was found to be 4 ng/μl. In this study, a 50 μl sheared DNA sample was taken for performing the size selection experiments. The results were analysed on an Agilent Tapestation and sample QC was performed on a Qubit system.

Recommendations for choosing reagent volume:

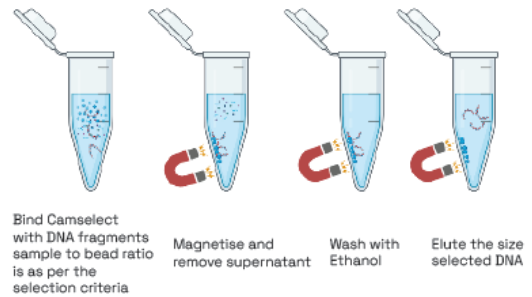
- Between 2x for fragments ≥ 100 bp,
- 1.5x for selecting fragments ≥ 150 bp,
- 1.0x for selecting fragments ≥ 200 bp,
- 0.8x for selecting fragments ≥ 400 bp



Camselect NGS was used at various sample to bead ratios to result in size specific fragment selection.

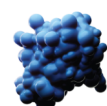
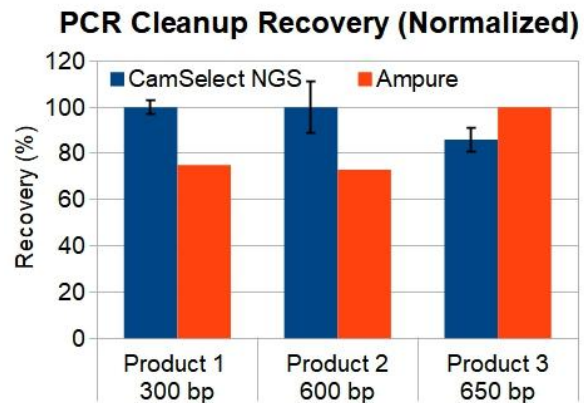
0.8X	2.0X
1.0X	Sheared DNA
1.5X	

Standard protocol for using Camselect across selection and depletion use cases. For detailed SOP, please visit: www.cambrianbioworks.com/camselect

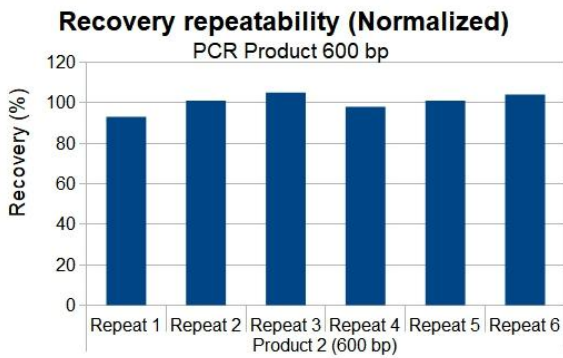
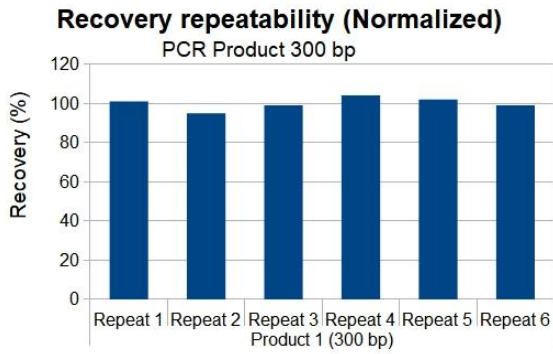


Clean up

Camselect is also applicable for clean up of the DNA and RNA fragments post PCR amplification. This enables removal of all excessive dntps and other elements of reaction mix. With high recovery rates of up to 90%, Camselect is the go to choice for quick column free magnetic stand based recovery. Below is a figure summarising normalised recovery observed for three different PCR fragments.



Most importantly Camselect also enables automation using any liquid handler platform. Besides this, Camselect also enables users to achieve high recovery consistently, as seen from the repeatability data for two different PCR products shown below, involving six repeats each.



Ordering Information

Product Name	Camselect NGS
Pack size	5ml / 75ml / 450ml
Accessories	Magstand - 8 station is provided for free with 75ml and 450ml pack size*
T&C	*Till stocks last

