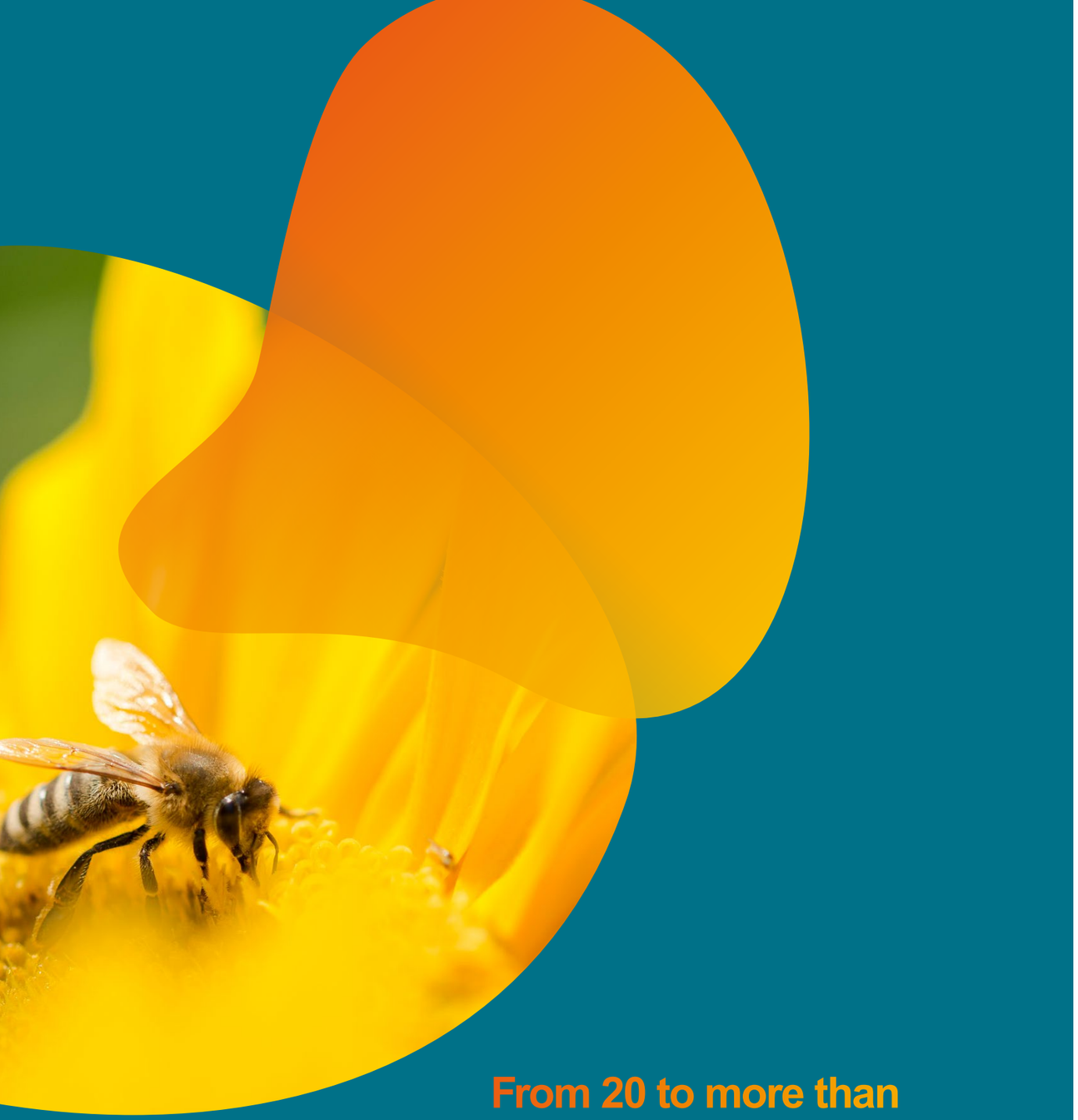
SNPline

the genotyping solution that scales with your needs

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

BIOSEARCH™ TECHNOLOGIES

GENOMIC ANALYSIS BY LGC



From 20 to more than 500,000 genotypes each day, SNPline™ offers you the flexibility to obtain high quality genotyping data at any scale.

SNPline modular laboratory instrumentation - the scalable genotyping solution

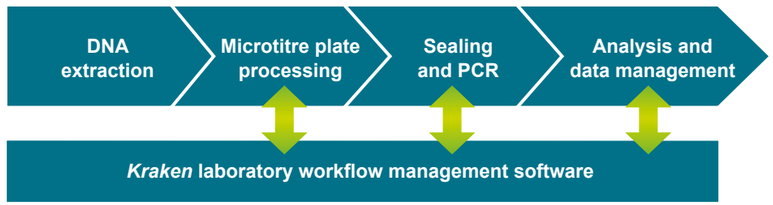
Adaptable to any throughput requirement
The SNPline system, produced by the laboratory instrument team at LGC Biosearch Technologies™, provides the ultimate solution in *scalable genotyping* in any laboratory setting.

Individual instruments in the SNPline workflow integrate with our proprietary **Kraken™** software package to deliver complete experimental workflow management and data analysis.

Start out with a ***SNPline Lite*** configuration and add instruments and 1536 well-plates to grow into the ***SNPline XL*** configuration as your daily throughput needs increase. Individual instruments also can be purchased separately.

From 20 to more than half a million individual data points per day, the unique SNPline approach enables generation and interpretation of data sets of any size to genotype SNPs, insertions or deletions.

SNPline modular workstation
The complete genotyping solution from DNA preparation to data analysis



- Automation reduces manual pipetting steps
- Flexibility allows wide variety of SNP to sample ratio combinations
- Simplified calling of results and bespoke reporting

Run only the samples you need and save on reagents, reduce setup costs and streamline data.

Why our customers implement the SNPline solution

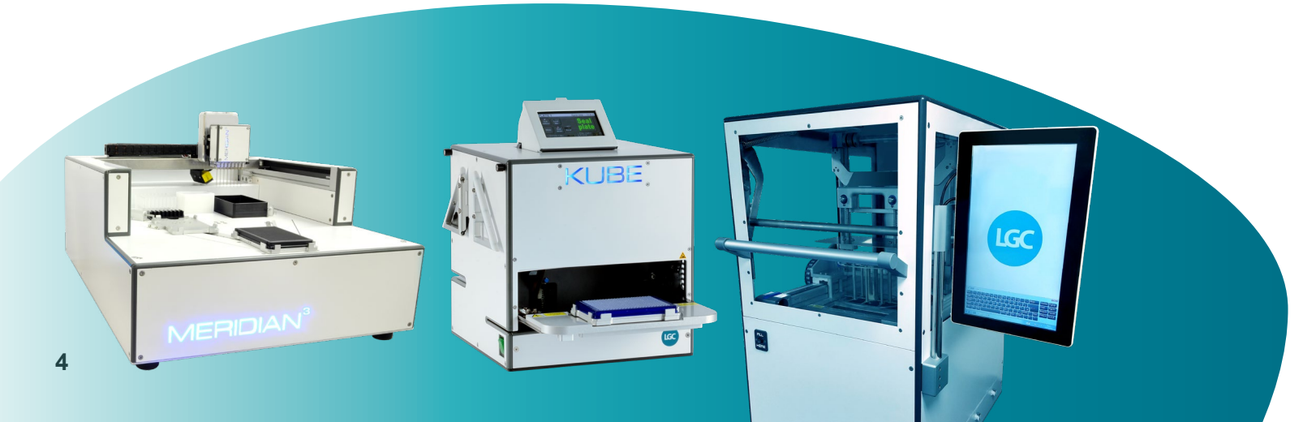
Grow with your business needs
SNPline is available in *multiple configurations* and can be used in combination with your existing laboratory equipment, enabling analysis of any number of samples for one or thousands of different SNPs.

- Complete software control to run any number of samples and any number of assays with full automation of dispensing and tracking of plates, samples and assays
- Flexibility to repeat only the downstream assays requiring further analysis with no restriction on configuration as with fixed array and chip based solutions
- Suitability for use with a variety of chemistry options including KASP™, TaqMan® or Invader®
- Solutions for DNA preparation and PCR in any plate density, including 1536-well plates.

Expert product and technical support
Our experienced laboratory based, scientific support team and field applications teams are on hand to provide full product and technical assistance where and when you need it. We can provide support for assays *targeting difficult SNPs or indels* and have extensive experience working with genomes from difficult organisms.

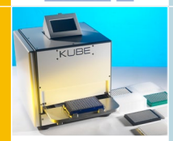
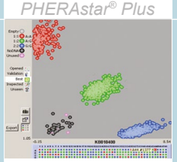
Cost effectiveness
Lower reagent costs and the ability to *run assays in only those wells where data needs to be interpreted,* provide significant savings compared to array based systems where the need to repeat a particular assay can necessitate a repeat of the entire data set. We use SNPline in our service laboratory. The development and deployment of cost efficient, reliable systems has been integral to our success.

- Low-cost genotyping
- Requires minimal DNA and has no requirement for expensive sample clean-up or pre-amplification preparation
- Meridian dispenses reagents only into those plate wells to be analysed
- Experimental set-up and data analysis costs are significantly reduced with Kraken software for data management and analysis
- Existing integration with a third-party cloud-based fluorescence data calling service.



SNPline modules

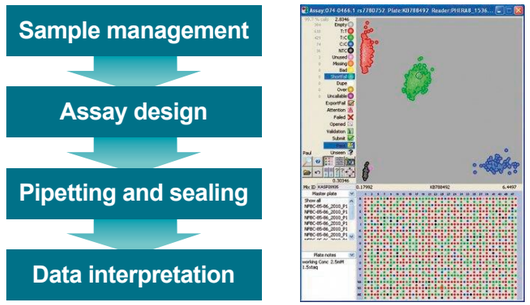
The modular SNPline system can be adapted to suit the needs of any new or existing genotyping setup. Two potential configurations and instruments that can be purchased individually are shown below.

	SNPline Lite		*SNPline Lite SNPline XL*	
DNA extraction	 *Magnetic plate*	• Purification of DNA by magnetic particles	 *oKtopure™*	• Walk away automation for nucleic acid extraction
Plate replicating	 *K-pette*	• Utilises SPTlabtec system modified for semi-automated plate replicating	 *repliKator™*	• Walk away automation for plate replication • Stamps microtitre plates from a range of sources into standard 96-, 384- or 1536- formats
Reagent dispensing	 *Meridian³™*	• Non-contact dispenser for 1-50 µL volumes • Efficiently dispense 1 µL to 1536-well plates	 *Meridian³*	• Non-contact dispenser for 1-50 µL volumes • Efficiently dispense 1 µL to 1536-well plates
Plate sealing	 *Kube™*	• Thermal plate sealing	 *Fusion³™*	• Laser sealing for any plate density including 1536 • SNPline XL also includes the Kube instrument
Thermal cycling for PCR	 *Hydrocycler²™*	• High-throughput water bath for 96-, 384- or 1536-well plates or Array Tape • Precise temperature control	 *Hydrocycler²*	• High-throughput water bath for 96-, 384- or 1536-well plates or Array Tape • Precise temperature control
Data read	 *FLUOstar® Omega*	• SNP microplate reader with five possible detection modes for 96- and 384-well plates	 *PHERAstar® Plus*	• Dual emission, single excitation plate reader • Typically used with 96-, 384- and 1536-well plates
Analysis and reporting	 *KlusterCaller™*	• Genotype calling for large numbers of cluster plots • Also can add complete Kraken workflow management system	 *Kraken*	• Full experiment design and data analysis • Workflow management

Kraken experimental design and data management software

Our proprietary Kraken software is a dedicated information and laboratory workflow manager for all genotyping work, carried out on the SNPLine, from sample storage to data analysis. The Kraken feature set was developed by scientists for small and large projects.

We also offer ***KlusterCaller*** software for calling data in the absence of Kraken data management, and ***SNPviewer*** as a tool to allow users to visualise data reported from our genotyping services laboratory.



KASP assays are available in two formats to optimise flexibility and cost efficiency

KASP *By Design*

The KASP By Design ***(KBD)*** assay is our most cost effective solution for primer design and assay development. The ***KBD*** service utilises our assay development software to provide the best *in silico* predicted assay. A ***KBD*** assay is shipped in a 2D barcoded tube and comprises the three designed oligos premixed at the appropriate concentration. When combined with our KASP-TF Master Mix your SNP genotyping will be ready to run. As with all our products and services, our technical support team is available to assist you with data interpretation and troubleshooting if required.

Note: the KBD service does not include assay validation prior to shipment.

KASP *On Demand*

The KASP On Demand ***(KOD)*** service includes full validation and assay optimisation by our in-house genotyping experts prior to shipment of the assay. Using customer sequence data, we optimise and fully validate the assay prior to shipping the oligonucleotides. Assay components are shipped pre-mixed in 2D barcoded tubes complete with full experimental protocols. As with the KBD service, combination of the assay with our KASP-TF Master Mix provides the complete solution, ready to use.

	Sequence provided using Biosearch Technologies' web based submission template	Design and preparation of oligos by Biosearch Technologies	Oligos combined into 2D barcoded tubes	Standard assay quantity per kit	Assay optimisation by Biosearch Technologies	Biosearch Technologies' assay validation against random DNA samples
KBD	Yes	Yes	Yes	2,500 assays (different sizes available on request)	No	No
KOD	Yes	Yes	Yes	2,500 assays (different sizes available on request)	Yes	Yes, using internal or customer provided DNA samples

SNPline and KASP genotyping reagents - cost effective genotyping

Our KASP genotyping reagents for the detection of SNPs and InDels provide a homogeneous, fluorescence based genotyping assay, utilising a unique form of competitive, allele-specific PCR that delivers extremely high levels of assay robustness and accuracy. The KASP chemistry utlilises universal FRET cassettes and highly specific Taq DNA polymerase with two competitive, allele-specific, KASP forward primers and one common reverse primer to generate high quality genotyping results.

The cost effective and proven KASP chemistry provides

- Compatibility with 96-, 384- and 1536-well plate formats from 1 µL to 20 µL reaction volumes
- 99.8% accuracy, independently assessed (reports are available on request)
- Very high SNP to assay conversion rate (>90%) - genotype difficult SNPs without sequencing
- Reduced starting material volumes with as little as 3 ng DNA of starting material utilised in the assay (dependent on genome size)
- Significantly reduced assay setup cost - no dual labelled probes required
- A passive reference dye (ROX) which operates as an internal control standard
- Compatibility with a wide range of fluorescence analysers
- Single-step, closed-vessel reaction to eliminate cross contamination
- Universal KASP reaction mix for use with any KASP assay.

Genotyping project examples

R&D project
For validation of 96 assays over 96 samples, the SNPline uses 16 x 1536 plates and can be run in less than three hours.
96 SNPs x 96 samples

SNP validation
Validation of SNPs for mapping, subsequent to NGS, can be enabled using 1000 x 1536 density plates with virtually no manual pipetting requirement.
2,000 SNPs x 768 samples

Population study
Analysis of discriminative SNPs from larger Fx populations can be achieved using 500 x 1536 plates.
250 SNPs x 3,072 samples

QC and DNA biobanking
Analysis of large sample numbers is easily achieved using the 1536 plate density to allow generation of over 25,000 data points per hour.
12 SNPs x 50,000 samples

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