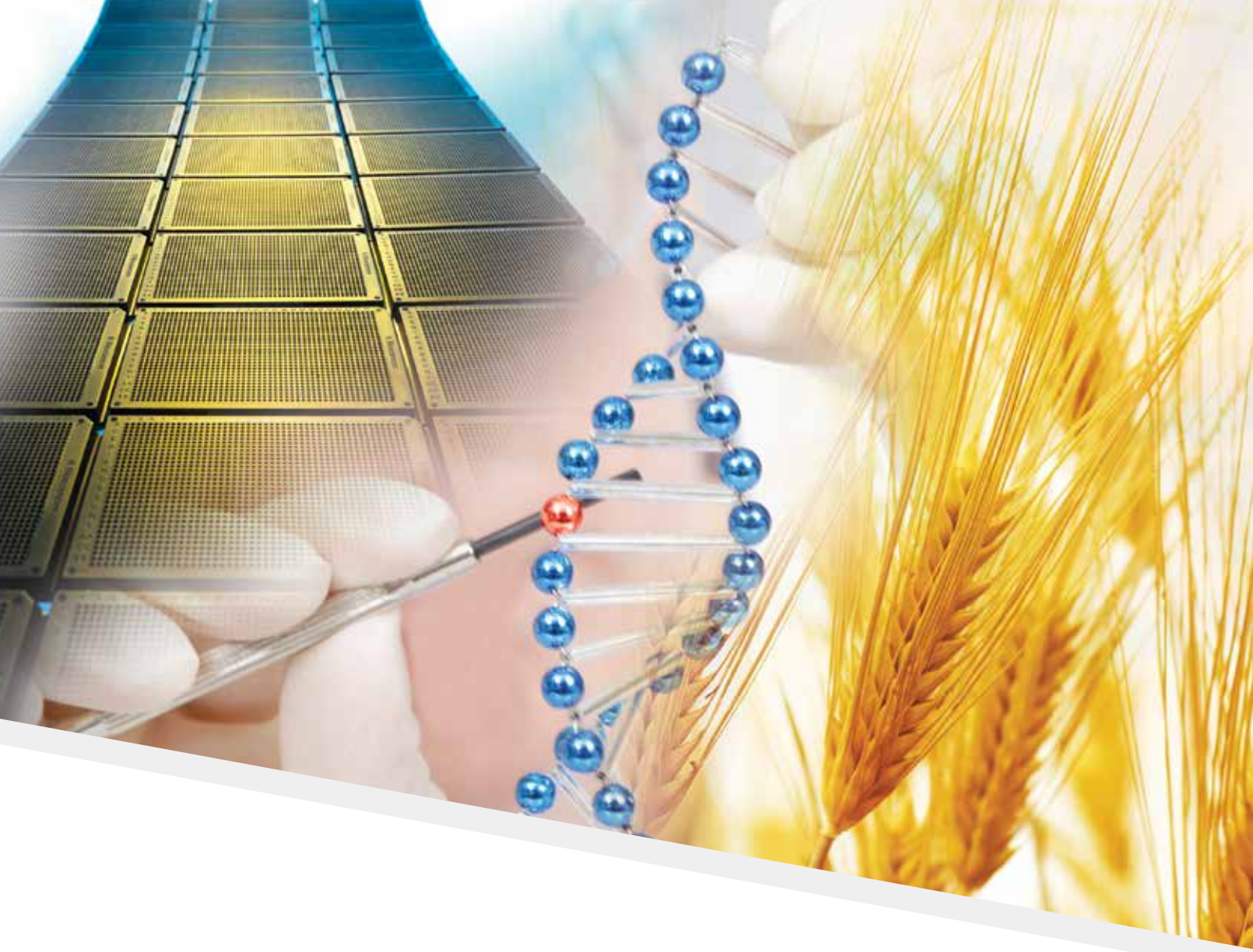


SNPline - the flexible genotyping solution

From 20 to more than 500,000 genotypes each day, SNPline provides an unrivalled solution for the generation of **flexible, high quality genotyping data.**

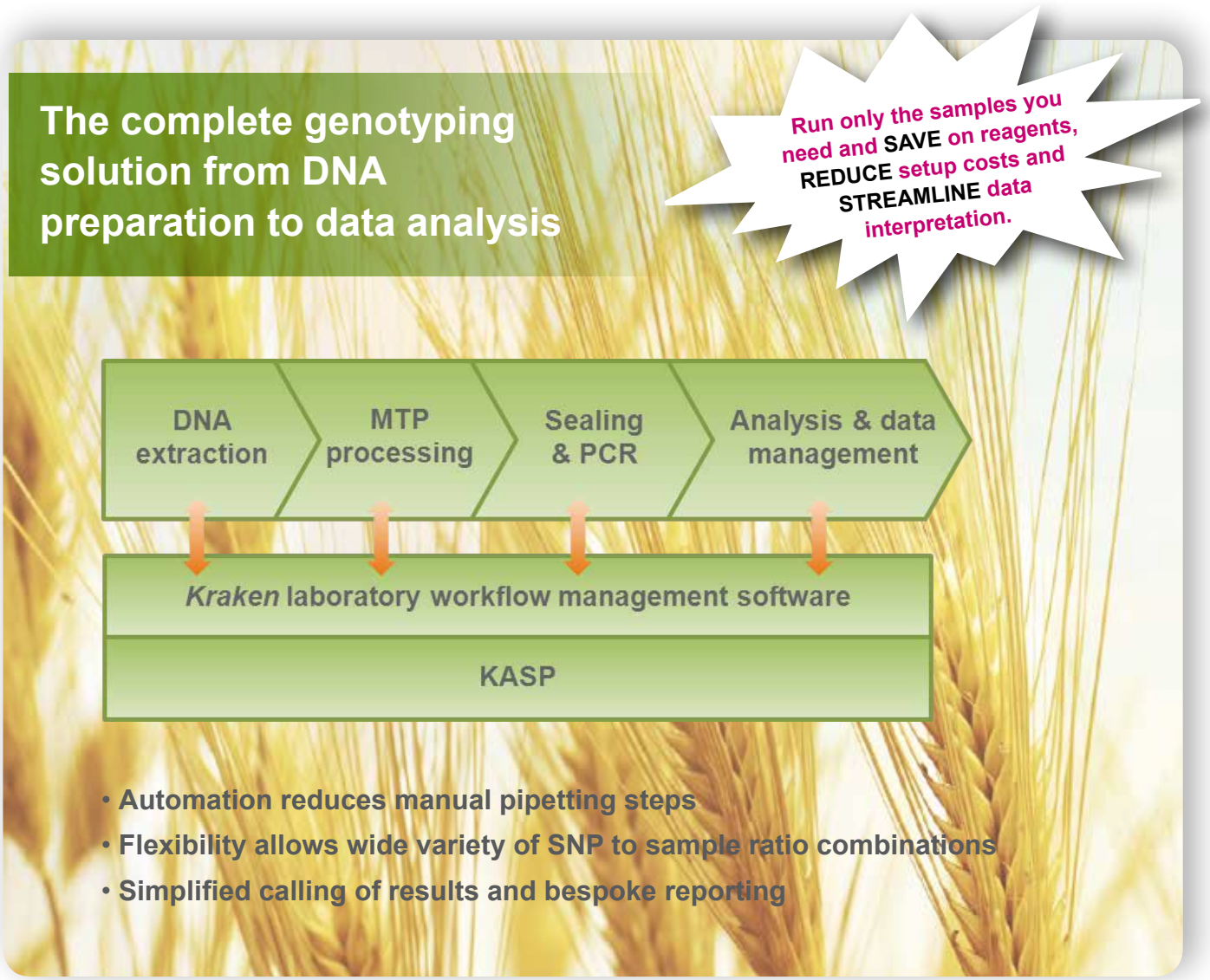
SNPline modular laboratory instrumentation - the flexible genotyping solution

Adaptable to any throughput requirement

The SNPline system, produced by the laboratory instrument team at LGC, provides the ultimate solution in **flexible genotyping** in any laboratory setting. Each SNPline can be provided with our proprietary **Kraken™** software package to enable complete experimental workflow management including assay design, extraction, sequencing, genotyping and data analysis.

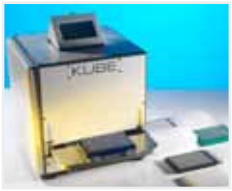
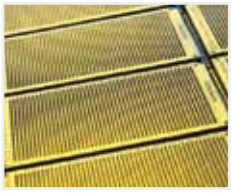
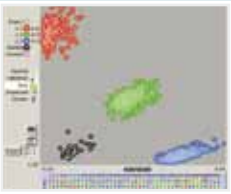
SNPline is available in ***SNPline Lite*** or ***SNPline XL*** versions and can be further customised to suit the needs of any genotyping capacity and / or can be designed to incorporate existing laboratory equipment. **From 20 to more than half a million individual data points per day,** the unique SNPline approach enables generation and interpretation of data sets of any size to genotype SNPs, insertions or deletions.

SNPline modular workstation



SNPline modules

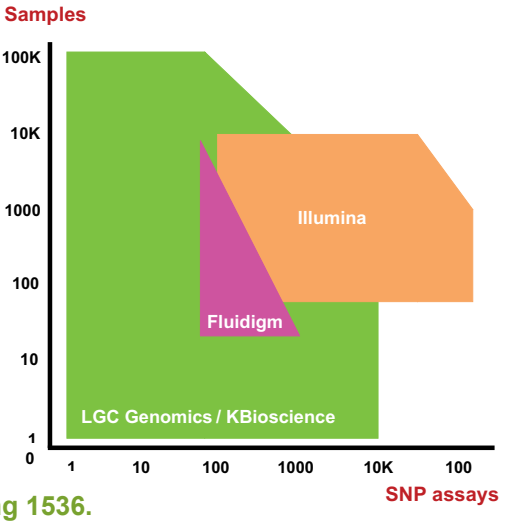
Available in ***SNPline Lite*** or ***SNPline XL*** versions, the modular SNPline system can be adapted to suit the needs of any new or existing genotyping setup.

	SNPline Lite		***SNPline XL***	
DNA prep	 *sep™box*	• Separation of DNA bound to magnetic particles	 *oKtopure*	• Walk away automation for nucleic acid extraction - coming soon -
Plate replicating	 *Kpette*	• Apricot designs semi-automated plate replicating	 *repliKator*	• Walk away automation for plate repilication
Reagent dispensing	 *Meridian*	• Suitable for any MTP configuration	 *Meridian*	• Dispenses 1 µL volumes into 1536 well plate in less than 40 seconds
Plate sealing	 *Kube*	• Thermal plate sealing	 *Fusion*	• Laser sealing for any plate density including 1536
Thermal cycling for PCR	 *Hydrocycler 4-16*	• High-throughput thermal cycling including e-PCR applications	 *Hydrocycler 16-32*	• High-throughput thermal cycling for MTPs in 96, 384 or 1536 density
Data read	 *Omega F*	• SNP microplate reader - reads both fluorescence and absorbance	 *PHERAstar*	• Dual emission, single excitation plate reader
Analysis & reporting	 *KlusterKaller*	• Genotype calling for large numbers of cluster plots	 *Kraken*	• Full experiment design and data analysis

Why our customers implement the SNPline solution

Unrivalled flexibility

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.



- Ability to run any number of samples and any number of assays with no compromise on speed or increase in cost per analysis
- Flexibility to repeat only the downstream assays requiring further analysis with no restriction on configuration as with 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.**

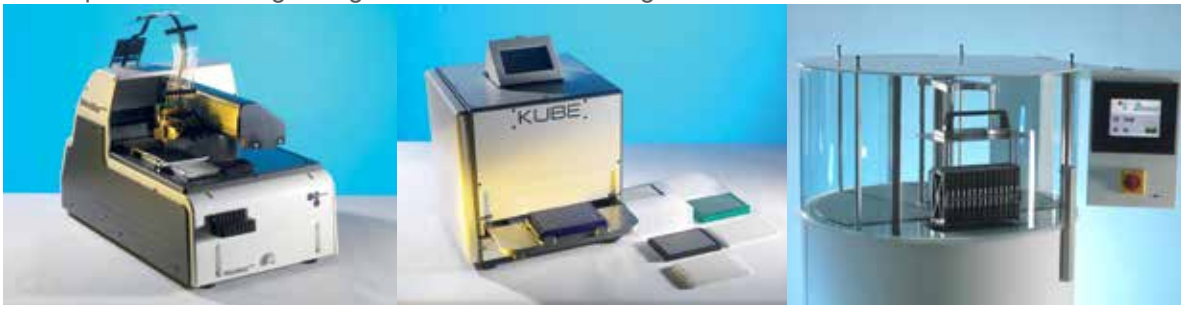
Cost effectiveness

Significantly lower reagent costs and the ability to **run assays in only those wells where data needs to be interpreted,** provides 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 laboratories and the development of cost efficient, reliable systems has been integral to our success.

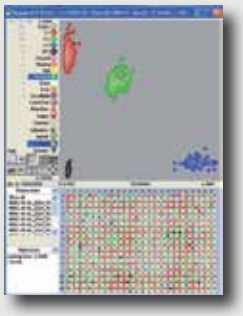
- Genotyping from as little as a penny or just a few cents per data point
- Requires minimal DNA and has **no requirement for expensive sample clean-up or pre-amplication** preparation
- Assay robots dispense reagents only into those MTP wells to be analysed
- Experimental set-up and data analysis costs are significantly reduced with the SNPline in combination with on-board **Kraken** workflow analysis software.

Expert product and technical support

Our experienced laboratory based, scientific support team 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.



Kraken experimental design & data management software



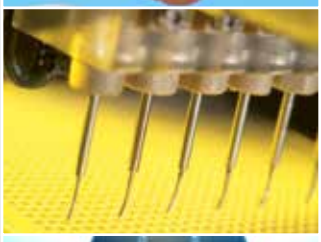
Our proprietary ***Kraken*** software is a dedicated information and laboratory workflow manager for all genotyping, sequencing, and extraction work, from sample storage to data analysis. It has been developed by scientists for small and large projects.

Sample management → Assay design → Pipetting & sealing → Data Interpretation

We also offer a range of other genotyping software solutions including ***KlusterKaller*** and ***SNPviewer.***

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 makes use of our ***Kraken*** assay development software, to provide the best *in-silico* predicted assay, although the service does not include full assay validation prior to shipment. A ***KBD*** assay is shipped in a 2D barcoded tube and comprises the three ***Kraken*** designed oligos premixed at the appropriate concentration. When combined with our KASPar mastermix 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 trouble shooting if required.

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, which are combined together in 2D barcoded tubes complete with full experimental protocols.
As with the ***KBD*** service, combination of the assay with our KASPar mastermix provides the complete solution, ready to use.

	Sequence provided using LGC web based submission template	Design and preparation of oligos by LGC	Oligos combined into 2D barcoded tubes	Standard assay quantity per kit	Assay optimisation by LGC	LGC 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 combines the use of a highly specific 5' – 3' exonuclease deleted Taq DNA polymerase with two competitive, allele specific, tailed forward primers and one common reverse primer.

The technology has been optimised over many years in our own genotyping service laboratories to provide unrivalled levels of SNP discrimination at a specific locus on a genomic DNA sample. The KASP reagent system combined with our SNPline instrumentation has underpinned the development of our genotyping service laboratories and has enabled us to generate over a billion KASP genotypes for customers worldwide.

The cost effective, novel KASP chemistry provides

- Compatibility with 96, 384 and **1536** plate formats from 0.5 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 3ng 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.

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



Complementary products and services

- **Genotyping**
  - KASP™ genotyping reagents and services
  - SNPline™ high throughput PCR workflow instrumentation
- **Extraction**
  - DNA and RNA extraction services
  - DNA extraction products (sbeadex®, Kleargene™ and mag™ kits)
  - Extraction automation instruments (oKtopure™)
- **Sequencing**
  - Sanger sequencing
  - NextGen sequencing services (Roche 454, Illumina HiSeq & MiSeq)
- **Other valuable tools**
  - Enzymes and PCR reagents (KlearKall™, KlearTaq™, KlearTaq™ HiFi)
  - Whole Genome Amplification (WGA) kits and services
  - DNA shearing instruments (Covaris)
  - Heat and laser sealing films (96, 384 & 1536-well plates)

For more details please contact your local representative or visit our website.

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