RANDOX

GENOMICS SERVICES

For Research Use

END TO END GENOMICS SERVICES

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WHO ARE RANDOX?

Randox Laboratories is a global market leader within the *in vitro* diagnostics industry. Developing innovative solutions for clinical, research and molecular labs, Randox also provide testing solutions for food testing, forensic toxicology, veterinary and life sciences markets.

Relatively new to the Randox Group is our Randox Genomics Services department, having been hugely successful in aiding the COVID testing programme, our established sequencing laboratory has been specifically designed and set up to fulfil a unique range of testing from our specialised laboratory in Northern Ireland.

Northern Ireland based laboratory provides a unique position in the EU/UK with major transport hubs for quick and efficient delivery and receipt of samples.

An End-to-End Genomics Solution

End-to-end sequencing solution inclusive of in-house bioinformaticians and data analysts.

Randox are the UK's first trusted commerical provider of Olink® technology for large-scale proteomic studies.

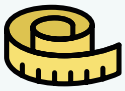
Proven track record and experience of providing a reliable, rapid sequencing service (COVIDSeq).

A dedicated team of genetic scientists including automation specialists, enabling adaption to throughput changes.

Multiple options for variable throughput from low throughput instruments for small projects, to the largest sequencer on the market for extensive and customisable projects.

Targeted genotyping solutions in multiple areas.

Huge capacity for storage and accessioning of multiple sample types with fast turnaround times.



Specific customised project planning and validation of services, tailored to the needs of the customer.

OUR SERVICES

Next-Generation Sequencing (NGS)

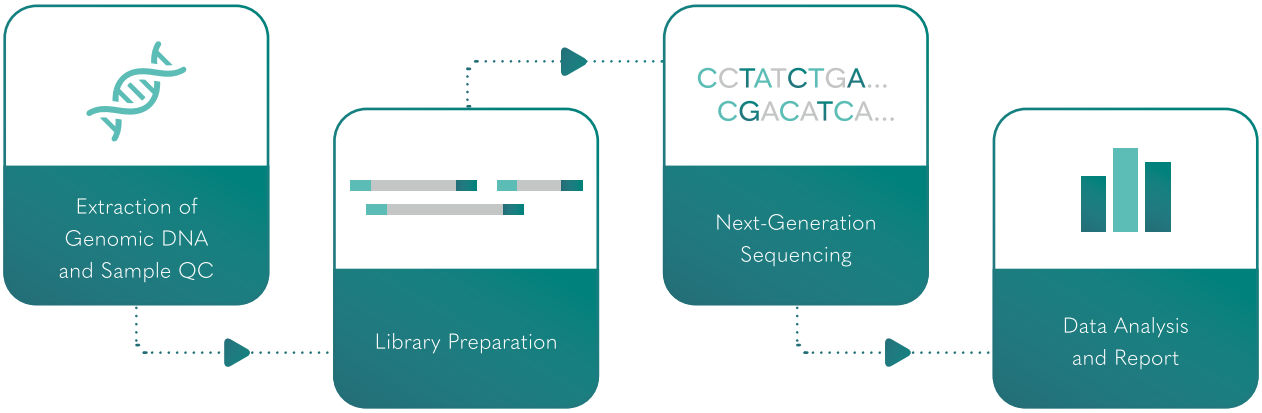
Genotyping

Olink® Service Provider

Next-Generation Sequencing (NGS)

Next-generation sequencing (NGS) is a sequencing technology that offers ultra-high throughput, scalability, and speed. The technology is used to determine the order of nucleotides in entire genomes or targeted regions of DNA or RNA.

NGS Workflow



Whole Exome Sequencing

Sequencing every protein coding region (approximately 21,000 genes) to identify any variants that may increase the risk of developing certain conditions or impact health/lifestyle. Virtual panels can also be applied to filter only the information you require.

Library Preparation Kit

Illumina DNA Prep with Exome 2.0 Plus Enrichment | SOPHiA Whole Exome Solution V2 | SOPHiA Clinical Exome Solution V3

Test Performance				
Assay Time	**Run Time**	**Input**	**Automation Capabilites**	**Sequencer Compatibility**
2 days	~26 hrs	50-1000 ng high-quality genomic DNA	Liquid Handling Robots	NovaSeq6000 NextSeq2000

Human Whole Genome Sequencing

Sequencing every single base in your DNA (approximately 3.2 billion) to identify any variants that may increase the risk of developing certain conditions or impact health/lifestyle.

Library Preparation Kit

Illumina DNA Prep PCR Free

Test Performance				
Assay Time	Run Time	Input	Automation Capabilites	Sequencer Compatibility
~1.5 hrs	~44 hrs	100 - 2000 ng	Liquid Handling Robots	NovaSeq6000

16S rRNA

16s rRNA gene sequencing involves the analysis of the prokaryotic 16s ribosomal RNA gene which is found in all bacteria and archaea.

Library Preparation Kit

Randox LDT Targeting V3/V4 region of 16s rRNA gene

Test Performance				
Assay Time	Run Time	Input	Automation Capabilites	Sequencer Compatibility
2 days	~56 hrs	5 ng DNA	Liquid Handling Robots	MiSeq NextSeq2000

Microbial Genome Sequencing

Shotgun sequencing reads all the genomic DNA in the sample, rather than just one specific region. Therefore, this sequencing method provides a vast amount of genetic information as it can identify archaea, bacteria, fungi and viruses.

Library Preparation Kit

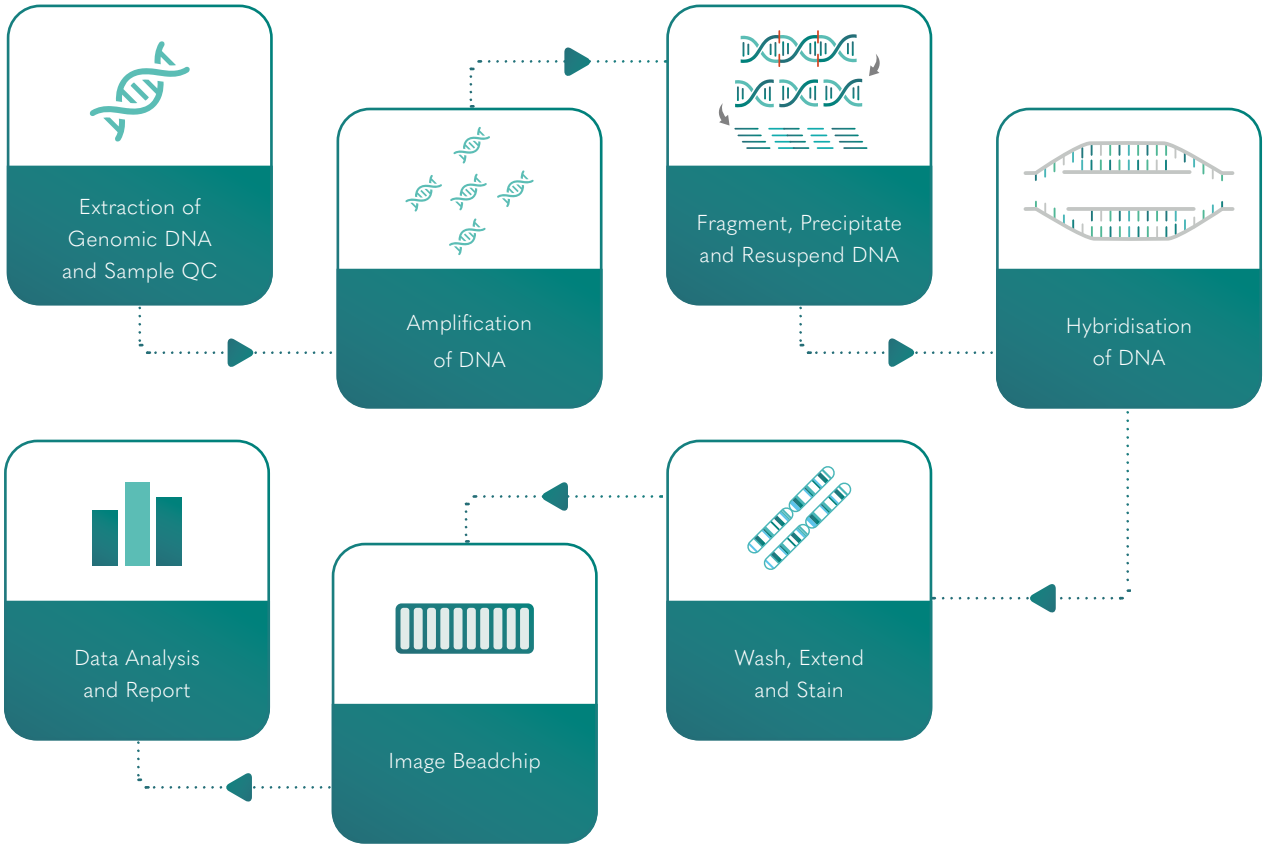
Illumina DNA Prep Kit

Test Performance				
Assay Time	Run Time	Input	Automation Capabilites	Sequencer Compatibility
2 days	~19-44 hrs	100 - 500 ng	Liquid Handling Robots	NovaSeq6000 NextSeq2000

Genotyping

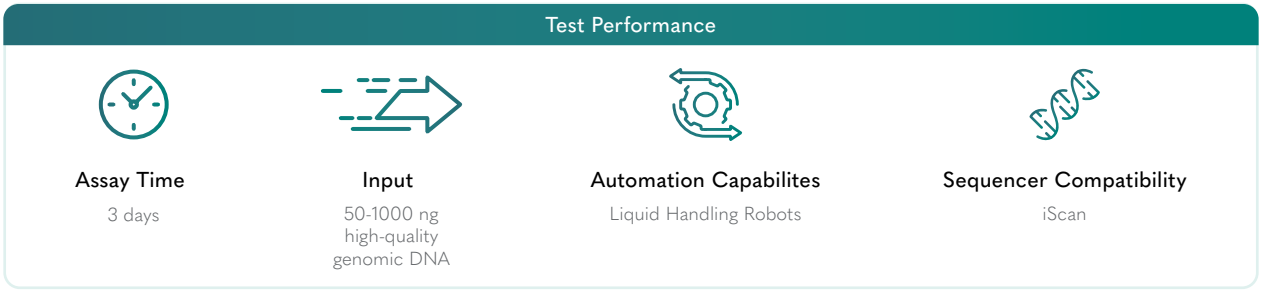
Genotyping is the process of analysing an individual's DNA to detect SNPs in genes of interest. These SNPs are compared to reference SNPs, available from years of genetic research, to determine differences in genetic makeup. Innovative Illumina genotyping technology is used to identify individual genetic codes using microarrays. Microarrays house hundreds of thousands of SNP markers, covering a variety of aspects E.g. Pharmacogenomics, nutrition and lifestyle genomics and agricultural genomics.

Genotyping Workflow



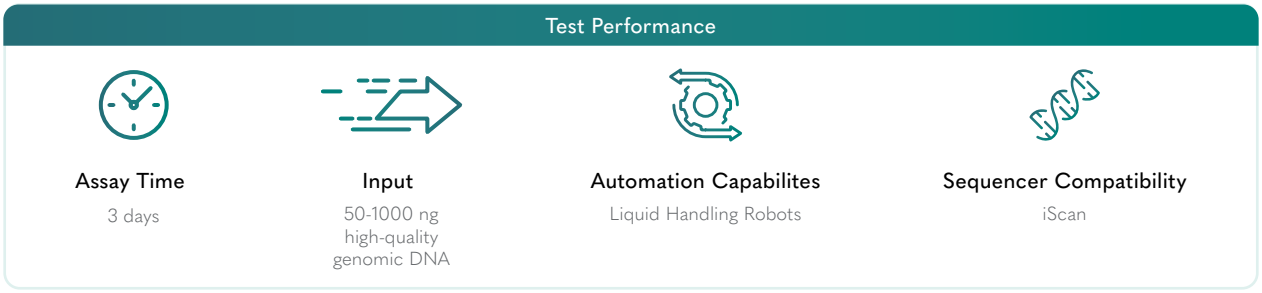
GSA + DTC Custom Content

Over 710,000 SNPs across the human genome.



GDA + Enhanced PGx

Over 1.8 million SNPs across the human genome enhanced with pharmacogenomic specific markers.



Pharmacogenomics

Pharmacogenomics is the study of how a person's DNA effects their drug response. It combines pharmacology and genomics. This is a relatively new field in science, however, it is expected to be the future of medicine as it focuses on personalised medicine, aiming to treat each patient individually. The overall aim is to provide the right drug at the right dose to the right patient, without the need for the traditional practice of trial-and-error prescribing. This reduces medical time and cost while maximising clinical outcome for the patient.

At Randox we use Illumina's Infinium Global Diversity Array with Enhanced PGx microarray to test for pharmacogenomic markers. This is the most comprehensive genotyping microarray on the market for pharmacogenomic research. The microarray features over 44,000 genome-wide PGx markers which span more than 20000 pharmacogenomic targets and gives 100% coverage of priority level A and B CPIC genes. The microarray allows access to important PGx genes such as CYP2D6, CYP2B6 and TPMT. CYP2D6 is highly polymorphic and is responsible for the metabolism of 25% of clinically used drugs, including antidepressants, beta-blockers, opioids, antiarrhythmics and antipsychotics.

The Infinium microarrays are scanned using Illumina's iScan system which can scan thousands of array samples per day enabling high-throughput genotyping whilst maintaining exceptional data quality, call rates and maintaining consistent reproducibility.

Olink®

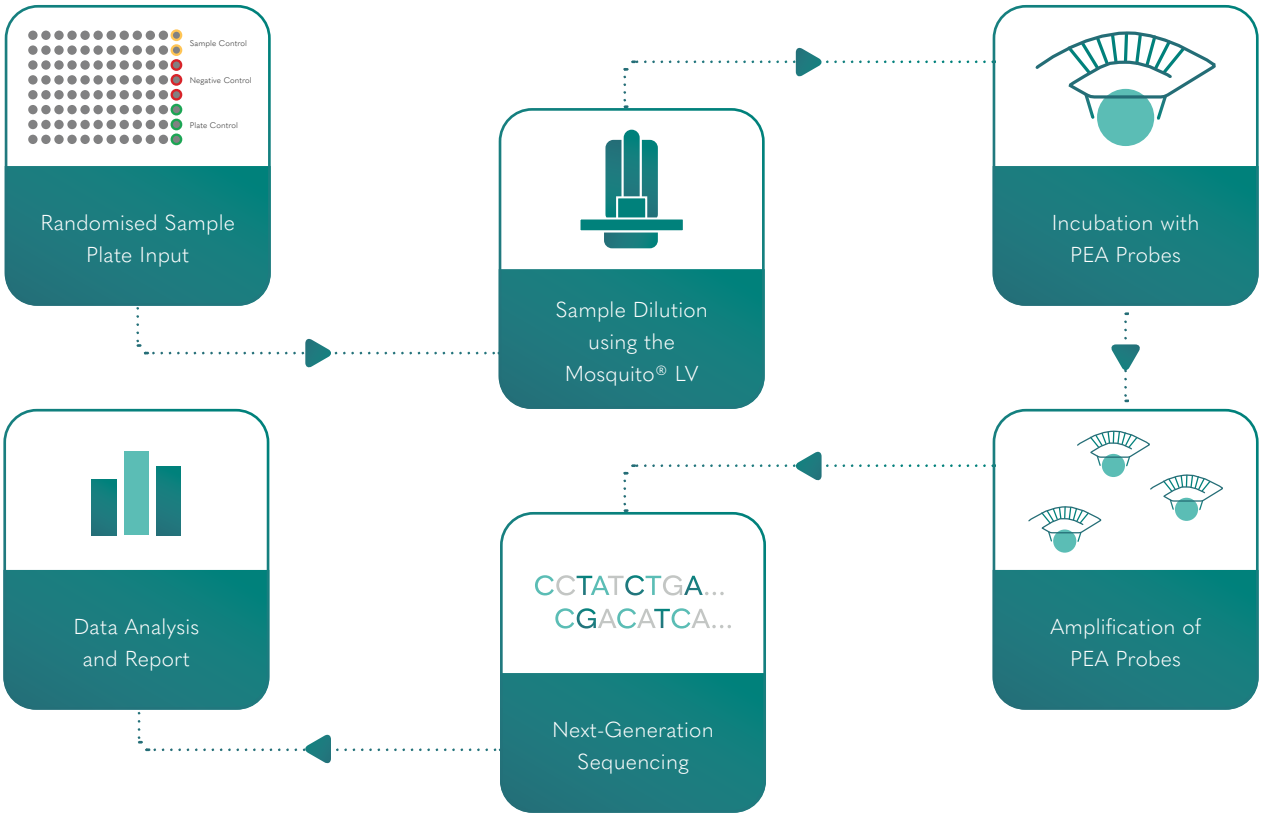
Olink® Certified Service Provider

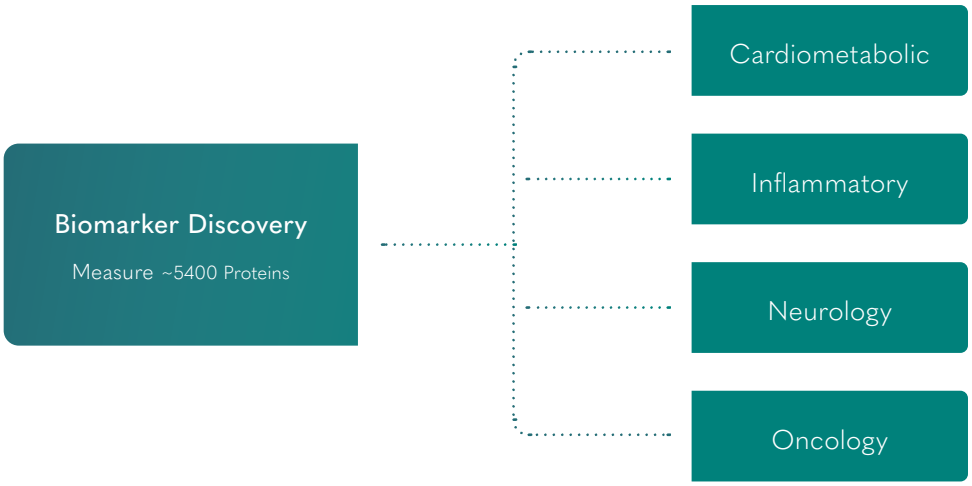
Comprehensive Proteomic Solutions Provider

Empowering high-throughput protein biomarker discovery, Randox is the UK's first commercial partner of Olink® Proximity Extension Assay (PEA). This high multiplex technology offers scientists involved in drug development, clinical, or basic life science research the service they need to run large-scale discovery proteomics without compromising data quality or robustness coupled with NGS readout on Illumina platforms.

As an Olink® Certified Service Provider Randox offer customers access to the entire Olink® protein library of approx ~5400 proteins for exploratory proteomics and multiomics. The library includes biomarkers that contribute the most to key research questions and cover as many biological pathways and functions as possible, including organ-specific proteins, secreted proteins, exploratory proteins, inflammatory proteins and established and ongoing drug targets.

Olink® Workflow





Olink® Technology – Features & Benefits

Covers all major biological pathways with ~5400 validated protein assays

High sample throughput suitable for your large-scale proteomic studies and research

Minimal sample volume with just 60µL sample input required for the complete library

Exceptional specificity in comparison to mass spec utilizing PEA technology

Analysis of both low and high abundance proteins (fg/mL – mg/mL) with high sensitivity

Compatible with a wide variety of sample types

Data output in relative and/or absolute quantification

Supported Olink® Platforms

As an Olink® Certified Service Provider, Randox are experts in generating high-quality data using all Olink® proteomic platforms.

Olink® Explore HT	
Proteins (per panel)	5,400 +
Sample	2 µL
Multiplex Panels	1
Quantification	Relative

Olink® Explore 384	
Proteins (per panel)	~3000
Sample	1 µL
Multiplex Panels	8
Quantification	Relative

Olink® Target 96	
Proteins (per panel)	~1100
Sample	1 µL
Multiplex Panels	15
Quantification	Relative

Olink® Target 48 Cytokine	
Proteins (per panel)	45
Sample	1 µL
Multiplex Panels	1
Quantification	Relative

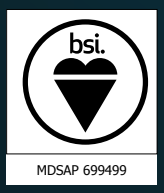
Olink® Flex	
Proteins (per panel)	~200
Sample	1 µL
Multiplex Panels	Mix & Match
Quantification	Relative or Absolute

Olink® Focus	
Proteins (per panel)	5,400 +
Sample	1 µL
Multiplex Panels	Custom
Quantification	Relative or Absolute

Randox Completes Olink® Concordance Test

Randox successfully completed the Explore Concordance challenge as beta testers of the Concordance program, certifying the ability to operate the PEA with the same level of competency than the Olink® Analysis Service.

Randox Summary Report		Acceptance Criteria	Result
QC Warnings	0%	Max 16% allowed	Passed the QC warning criteria
Detectability	97.2%	Min 85% allowed	Passed the detectability criteria
Intra CV	9%	Max 15% allowed	Passed the CV criteria
Median correlation coefficient (r)	0.98	Min 0.9 allowed	Passed the correlation criteria
Coefficient of determination (r2)	0.96	Min 0.9 allowed	Passed the correlation criteria
Overall, Randox passed all QC criteria's successfully passing the Olink® Concordance Test on Explore 3072			



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