



Firalis Molecular Precision

From Clinical Samples to Decision Making

Multi-Omics Biomarkers R&D and Clinical testing

Summary

- Our Offer
- Sample Management
- Clinical Testing
- Bioinformatics and Statistics
- Assay Development

Firalis Molecular Precision

Firalis is a service provider whose aim is to **support biomarker R&D** with **cutting edge analytical technologies** and **actionable outcomes**

+15

Years of
Expertise

SPECIALIZATION

Oncology, Neurology, Cardiology

+60

Qualified
Employees

EFFICIENCY

Quality, Capacity, Timing

+150

Customers
EU/US

CUSTOMIZATION

Flexibility, Adaptability, Responsiveness

Our Offer



Your One-Stop-Shop for Biomarkers R&D



Sample Management



Deep Freezing

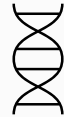


LIMPS

24/7 Monitoring

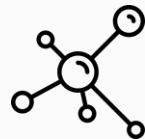


Genomics



Transcriptomics

Proteomics



Metabolomics



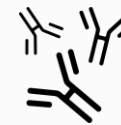
Companion Dx



Targeted Sequencing



ELISA Assay



High Bar Analytical and Clinical Validation



Probes Design

Manufacturing



Recombinant Proteins
Monoclonal Antibodies

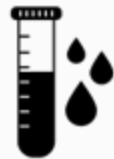
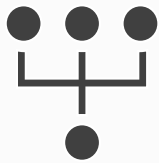
IVD Certification
and CE-marking



Supporting Research and Clinical Programs

Sponsor

FMP



Research/Clinical Program

Samples collection

Biobanking

Bioanalysis

Data Analysis

Actionable Insights

(Biological question)

(Blood, Serum, Plasma, Exosomes, CSF, FFPE, Tissue, Cells...)

(-4°F, -112°F, -238°F 24/7 monitoring)

(Multi-Omics)

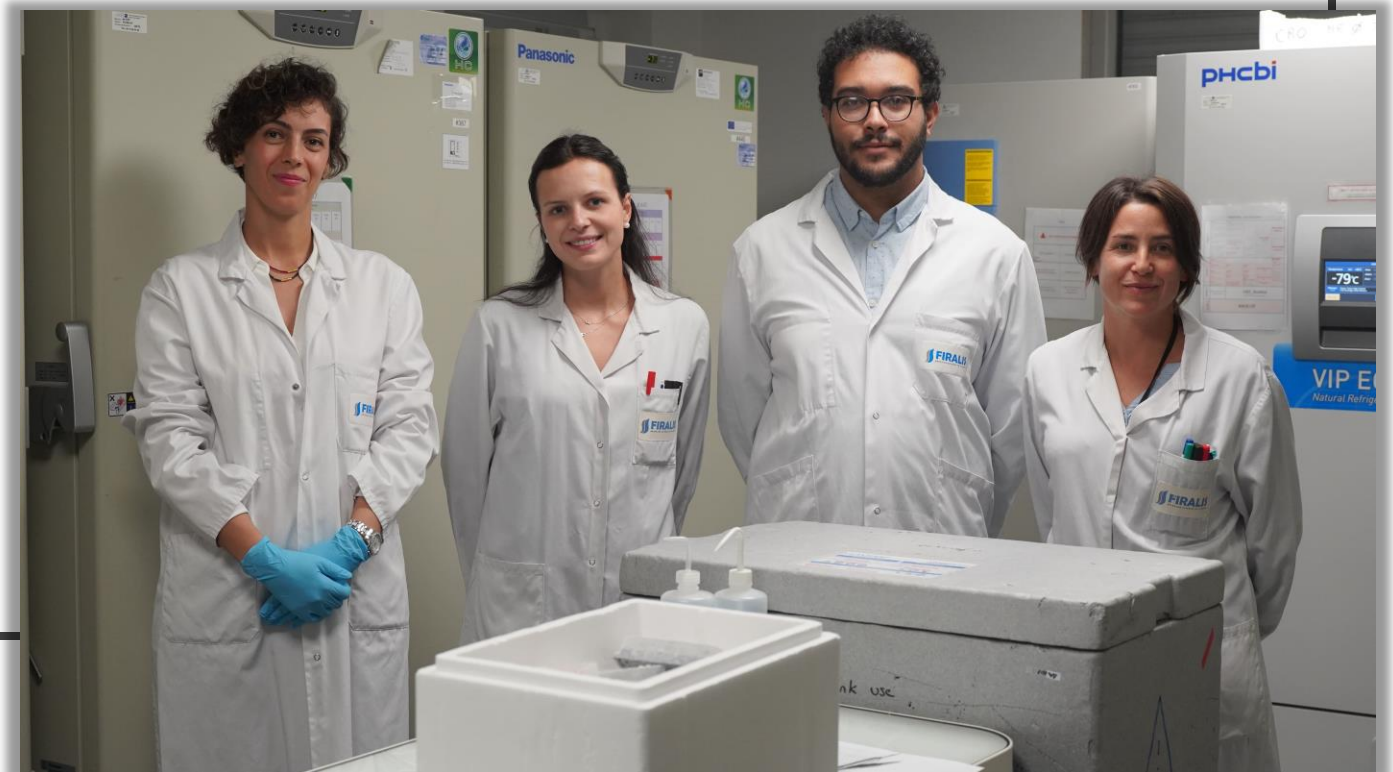
(Bioinfo and Biostats)



FIRALIS quality Standards:



Biobanking Facilities



Reliable Sample Management System

Large Capacities



2.000.000 samples

-4°F

-112°F

-238°F

Reliable System



NFS-96 900



Non-stop Monitoring

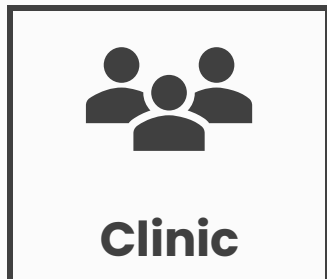


Spared Generators



Backup Freezers

Simple and Fast workflow



Clinical Testing



Our Genomics Equipment

DNA / RNA Extraction



*High throughput RNA/DNA Extraction
ThermoFisher KingFisher Apex*

qPCR



*Real-time qPCR
Biorad CFX96 Touch Real-Time PCR
Detection*

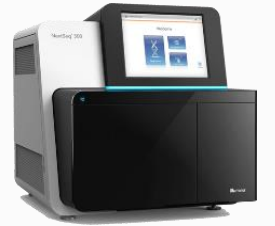


*Real-time qPCR
ThermoFisher QuantStudio 5 IVD*



*High-throughput microfluidic real-time qPCR
Fluidigm Biomark™ HD*

DNA / RNA Sequencing



*Next Generation Sequencing
Illumina NovaSeq X Plus, 6000™ / NextSeq™ 550,
2000*



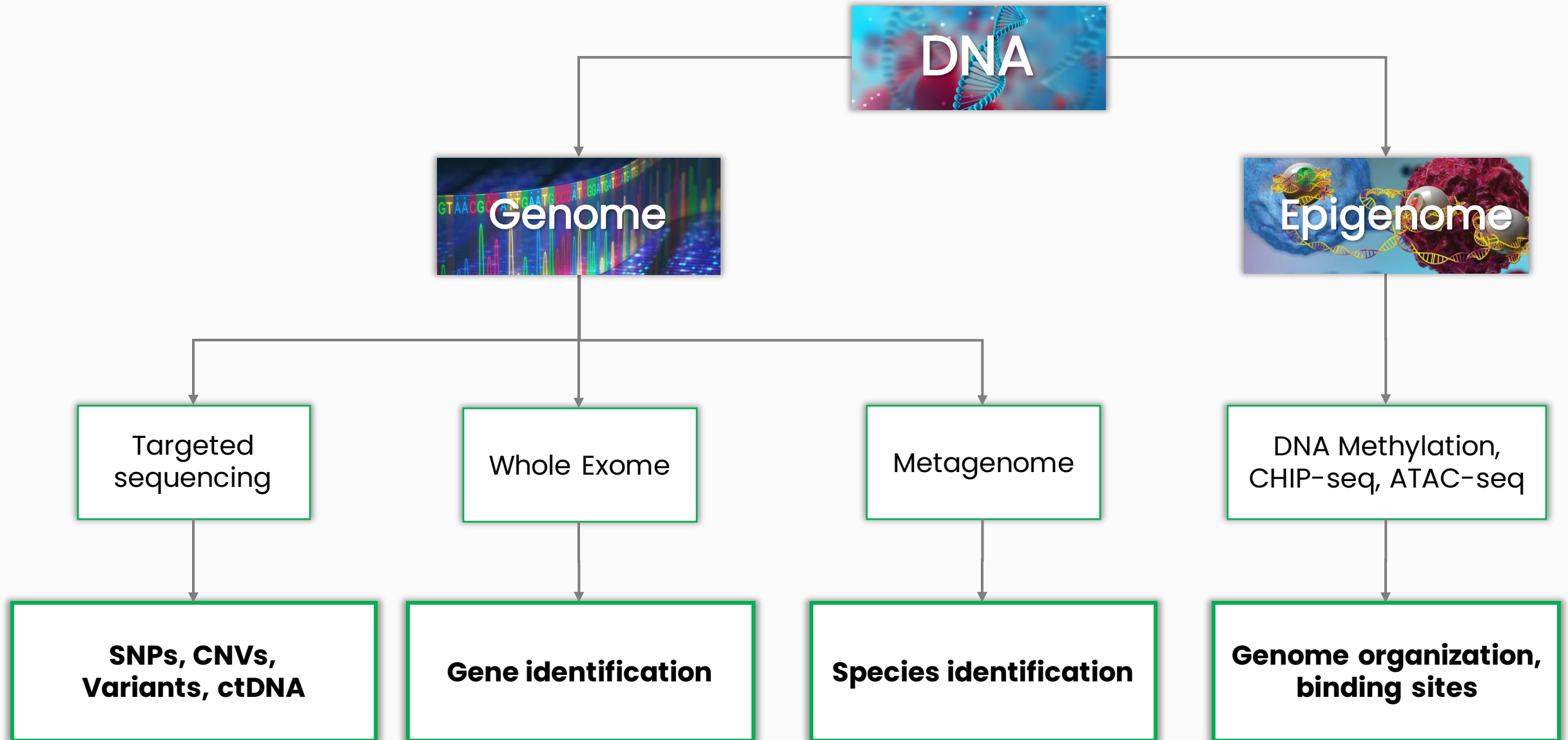
*miRNA and mRNA sequencing
HTG Molecular Diagnostics HTG
EdgeSeq*

Single Cell Sequencing

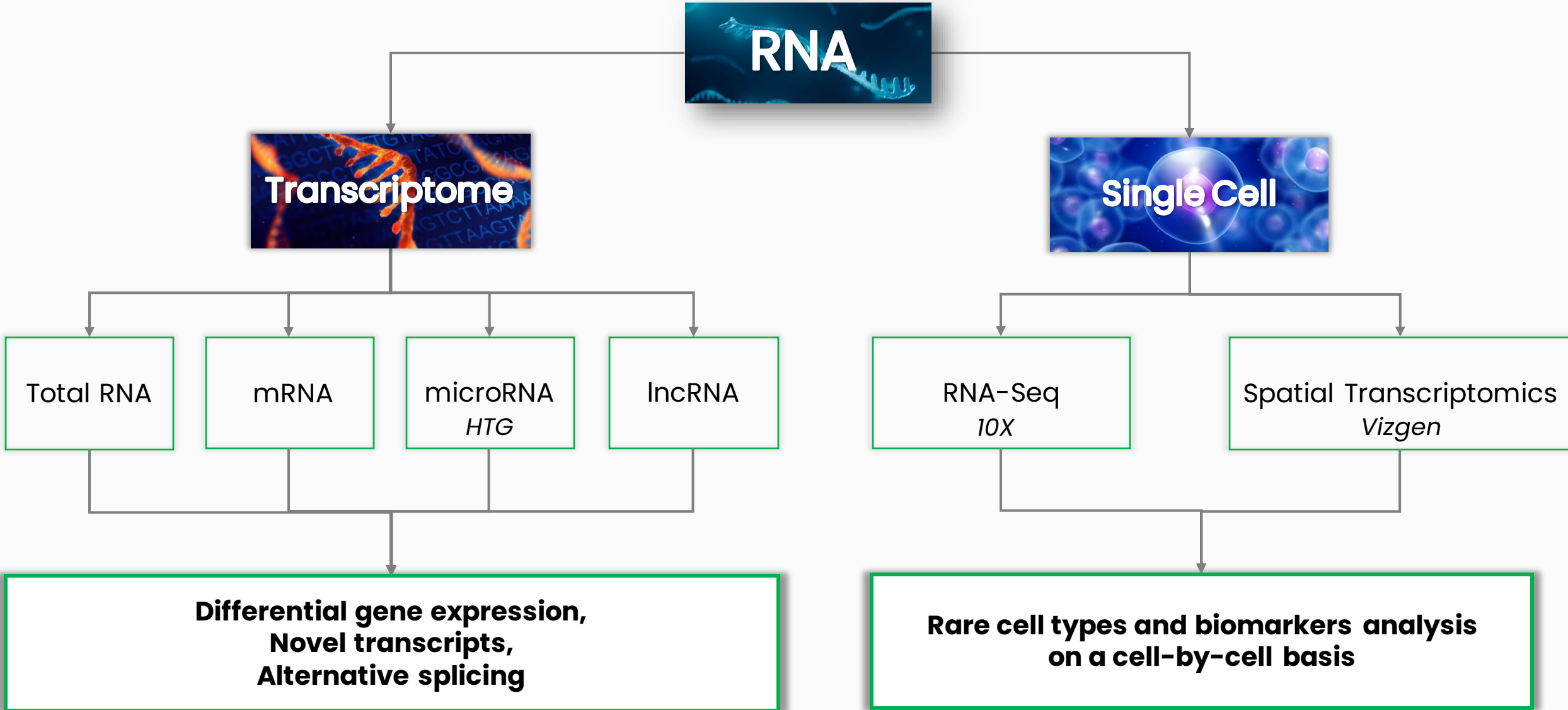


*Single Cell Sequencing
10X Chromium iX*

FMP Solutions: Genomics



FMP Solutions: Transcriptomics



Multiple qPCR Platforms

MULTIPLE APPLICATIONS

Gene expression

SNP genotyping

Copy Number Variation

HIGH FLEXIBILITY

Real-Time PCR – 96 well plates



CFX96 Touch



QS5 IVD



Bio Rad Opus

Microfluidic qPCR



Biomark™ HD - Cost-Effective – Low sample qty



Flex Six IFC



48.48 IFC



96.96 IFC

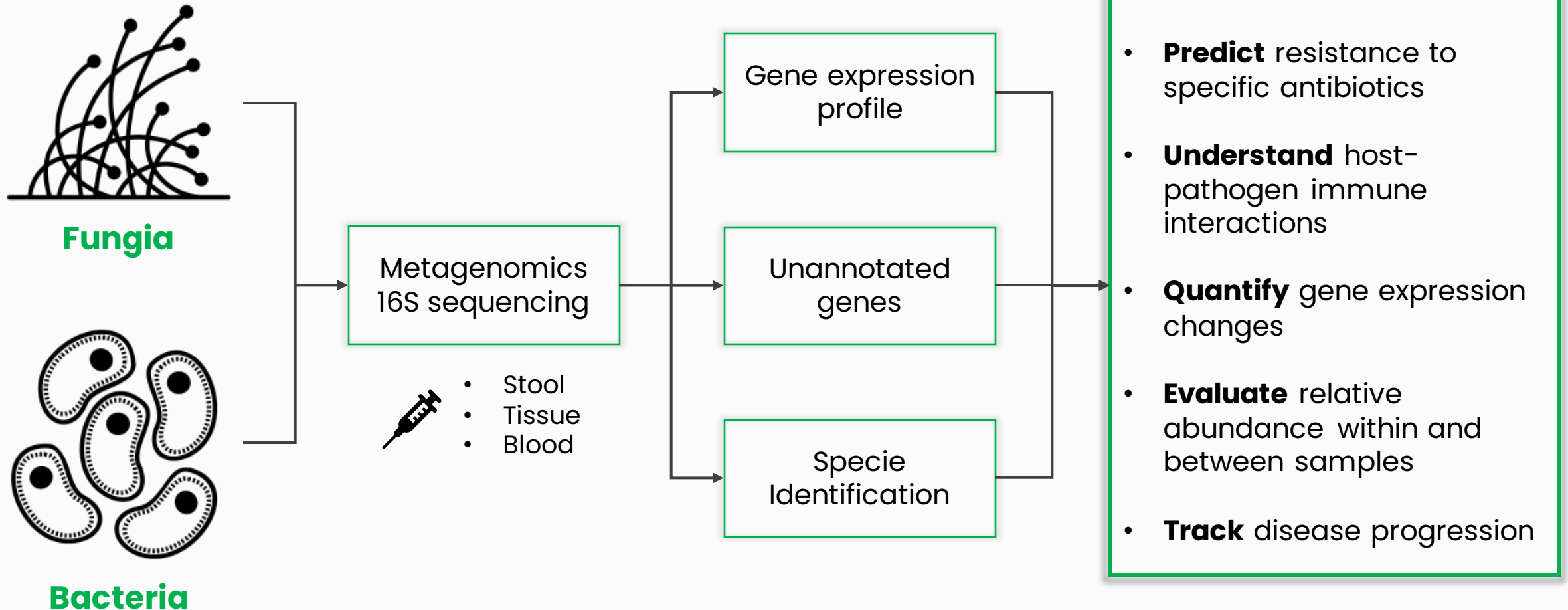


192.24 IFC

Technology	Reactions/run	OUR OFFER
Flex 6	144	Target Discovery Target Selection
48.48	2304	
96.96	9 216	Target Validation Pilot Screening
dqPCR	36 960	Routine testing

Microbiome Exploration

Study **microbial transcriptomes** and **metatranscriptomes** with next-generation RNA-Seq*



*Metatranscriptomes encompass all RNAs encoded by a group of organisms in a complex sample.

Non-Coding Transcriptome: microRNA

microRNAs are small noncoding RNA molecules that function broadly as **negative regulators of gene expression** to control a wide range of cellular processes.

Automated workflow with **extraction-free chemistry**

Expression profiles in about **36 hours**

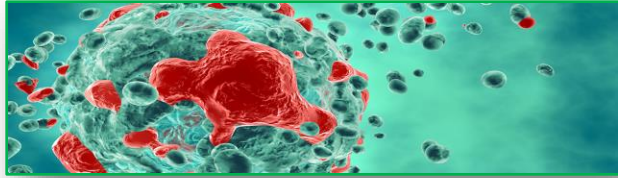
Low sample volume :

- Plasma/Serum : 15 μ L
- FFPE : 10mm² x 5 mm

High reproducibility



microRNA Panels (HTG®)

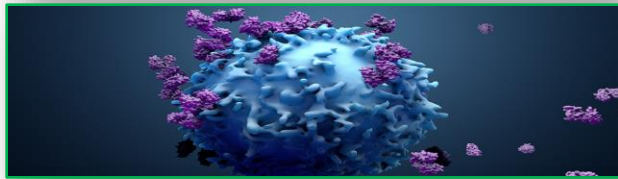


HTG miRNA Whole Transcriptome Assay **2083 miRNA**



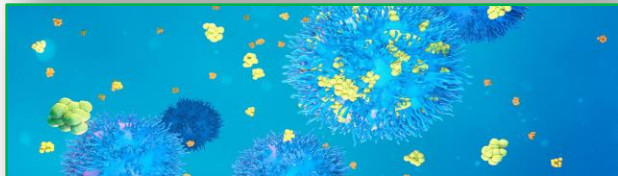
HTG Oncology Biomarker Panel

Comprehensive characterization of genes associated with tumor biology
2549 mRNAs



HTG Precision Immuno-Oncology Panel

Characterize tumor microenvironment and immune response
1392 mRNAs



HTG Immune Response Panel

Analyze genes associated with immune response to infection and AI diseases
2002 mRNAs



HTG Mouse mRNA Tumor response Panel

Analyze genes associated with Oncology, Immunology and Inflammation
1659 mRNAs

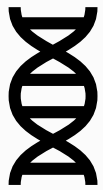


HTG Transcriptome Panel

Comprehensive analysis of the human mRNA transcriptome
19 396 mRNAs

Cutting-Edge Single Cell Analysis (10X[®])

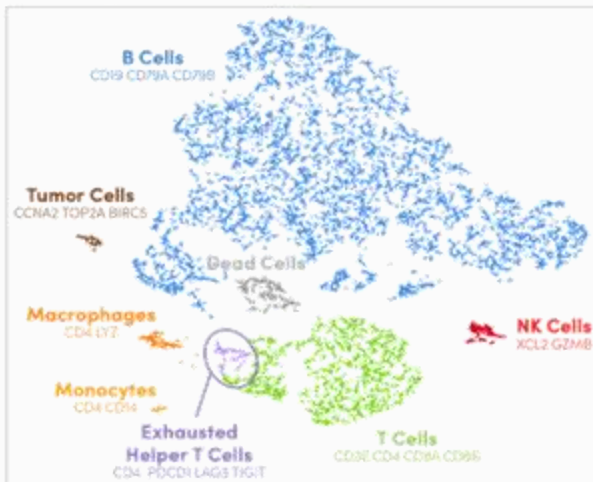
Explore gene expression profiles at a single cell level combining gene expression data with cell surface markers, TCR and BCR clone frequencies or open chromatin analysis.



GENE EXPRESSION

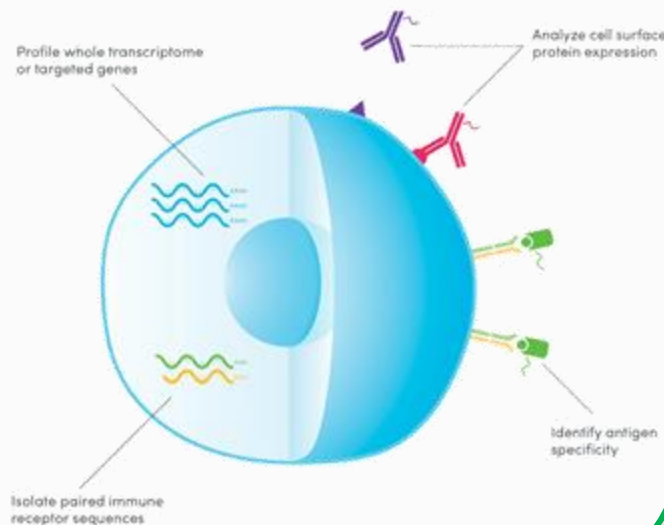
Whole Transcriptome
Targeted gene expression
CRISPR screening

Gene Expression t-SNE



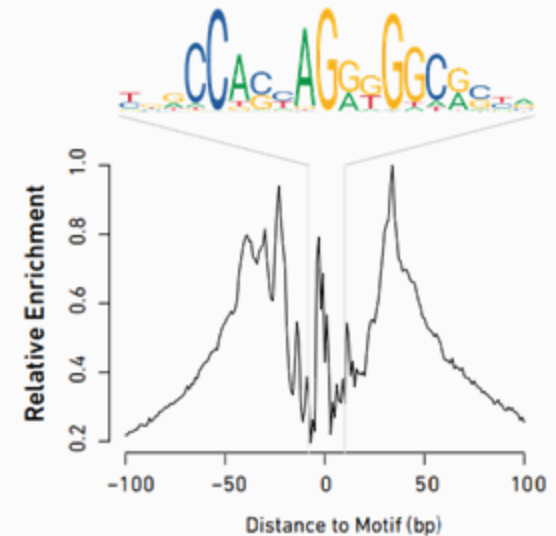
IMMUNE PROFILING

Cell Surface Proteins
T/B-cell Receptors profiling



EPIGENETIC ANALYSIS

Chromatin accessibility
ATAC-seq, CHIP-seq

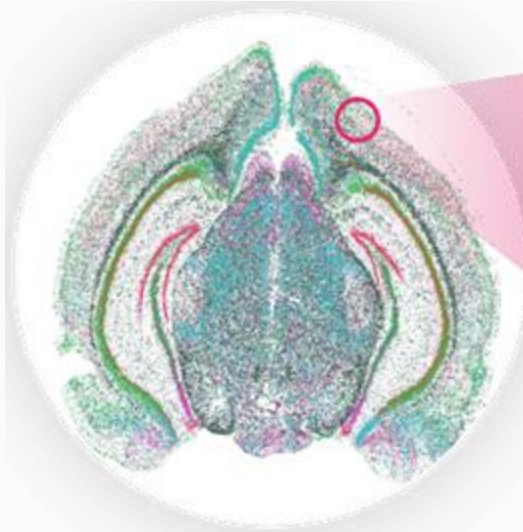


Real Single-Cell Spatial Transcriptomics

Explore new dimensions with MERSCOPE™, the first high multiplexing, high resolution in situ platform to combine single-cell and spatial genomics analysis powered by MERFISH technology.



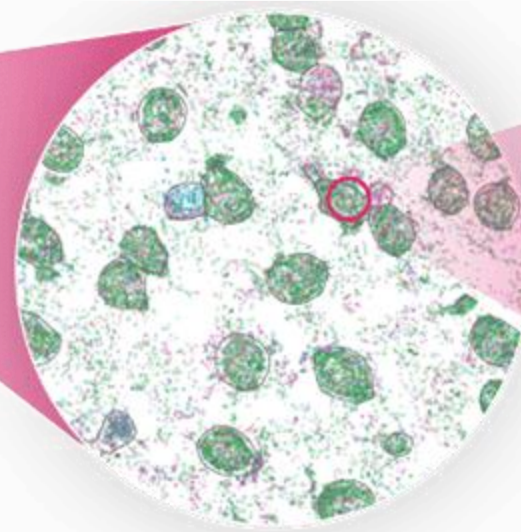
Highest detection efficiency and resolution available for spatially profiling the transcriptome, from whole tissue section to single-cell and finally sub-cellular imaging across the whole tissue.



WHOLE SECTION

9 x 7 mm

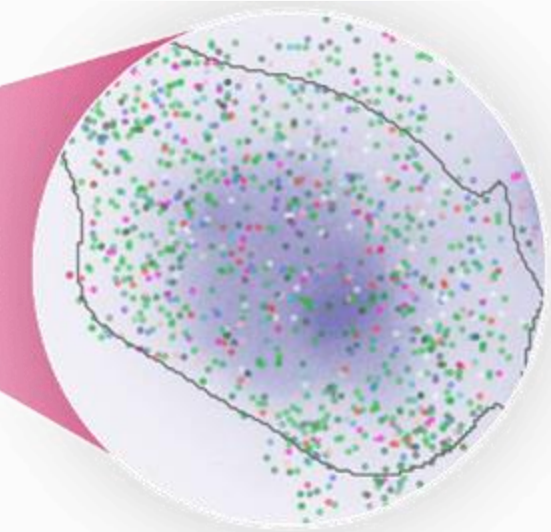
Organization of tissue



WIDE FIELD OF VIEW

200 x 200 micron

Cell interaction/function



SUB-CELLULAR

12 x 12 micron

L2/3 IT Glutamatergic neuron

Our Proteomics Equipment

Large Screening



Targeted protein discovery (Olink)
Fluidigm Biomark™ HD/ NGS NS2000



Next Generation Sequencing
Illumina NextSeq™ 2000

Quantification



Bead-based multiplexed immunoassays
Biorad Luminex® BioPlex 200™



Automated multiplex analysis
Protein Simple Ella™ Simple Plex™



ECL multiplexed immunoassays
*Meso Scale Discovery® (MSD)
SECTOR Imager 6000*

Ultra-sensitive



Quanterix SP-X™
Simoa multiplex biomarker measurement detection

Oncology



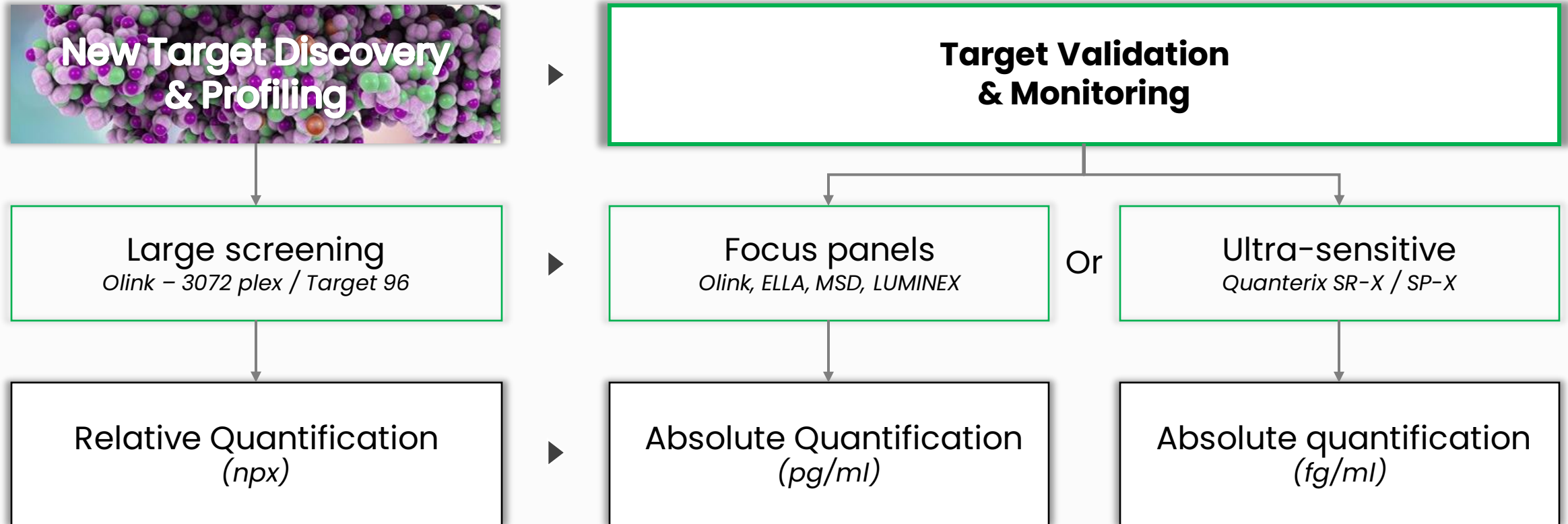
SR-X™ Biomarker Detection System
Single-Molecule Detection

Neurology

FMP Solutions: Proteomics

From **large screening to absolute quantification**,
Firalis support all types of samples and analytes to provide the most suitable outcomes for your project

More than 100 analytes are already validated.



High Throughput Screening (Olink®)

High-throughput screening of multiple biomarkers using **small volumes** of patient material generating **high-quality data** that is actionable for decision making.

3000 validated protein assays

Covers all major clinical pathways

High sample throughput

Suitable for large-scale proteomics

Minimal sample consumption

Uses just 6µL for the complete library

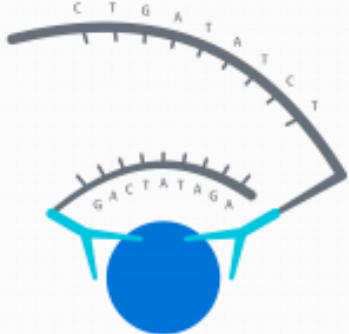
Exceptional specificity

Thanks to the PEA technology

High sensitivity & dynamic range

Low and High abundance (fg/mL – mg/mL)

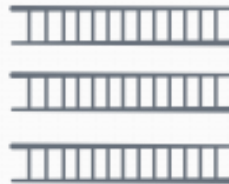
Immunoreaction



Extension



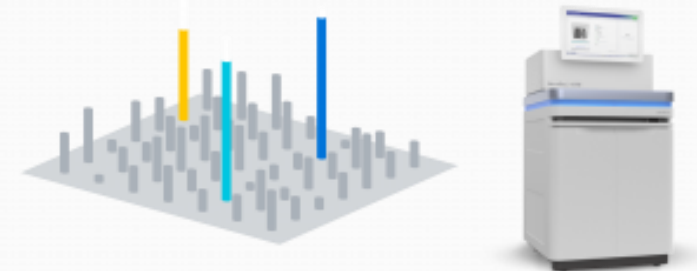
Amplification



Detection



Sequencing & Analysis



Absolute Quantification of Protein

Multiplex and absolute quantification of proteins in Serum, Plasma, and Cell culture supernatant in all therapeutic areas with **fixed and custom panels** available

+ 100

Analytes validated



ECL multiplex
MSD SECTOR Imager 6000

Pg/ml

High Sensitivity



Automated multiplex
Protein Simple Ella™ Simple Plex™

+ 1000

Analytes available



Bead-based multiplex
Biorad Luminex® BioPlex 200™

Quantify Proteins at Ultra-Low Level

Detect circulating biomarkers at ultra-low levels

For early-stage detection of disease progression – even at healthy baseline level.

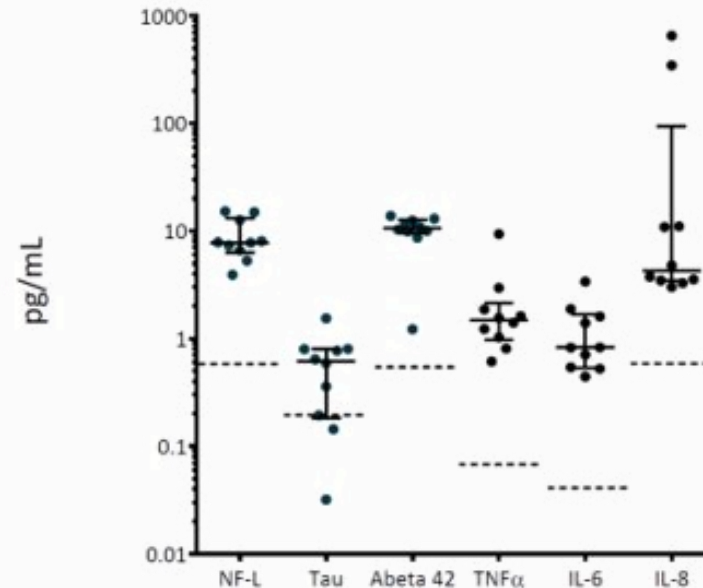
- ✓ **Sensitivity** : 1000-fold concentration of assay signal and reduction in non-specific background
- ✓ **Analytics** : proprietary acquisition algorithms and machine learning maximize dynamic range and S/N
- ✓ **Innovation**: innovative panels targeting Biomarkers in Blood, Plasma and CSF



Quanterix SP-X
Oncology



Quanterix SR-X
Neurology



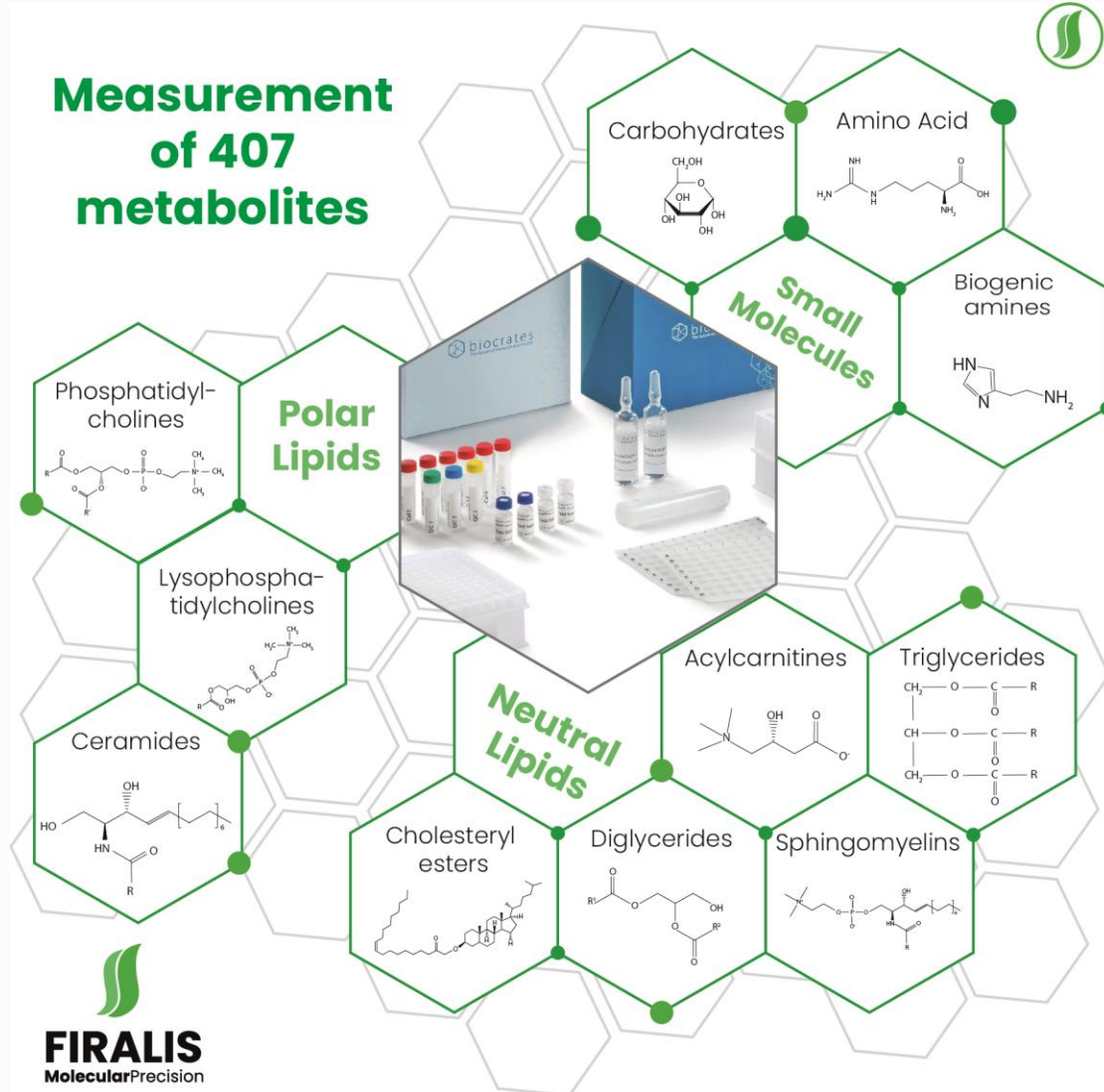
*Multiplex measurement of low abundance circulating proteins :

Quantitative detection of normal endogenous neurodegeneration biomarkers and inflammatory cytokine levels using the Simoa bead-based assay kits on the SR-X. Distribution of sample readings are shown along with LoQ of each assay (dashed lines)

FMP Solutions: Metabolomics

AbsoluteIDQ® p400 HR kit is the first ready-to-use, standardized solution for broad

Lipid and Metabolic profiling on mass spectrometers



11

Compounds Classes

- Amino acids (21)
- Biogenic amines (21)
- Hexose (1)
- Phosphatidylcholines (172)
- Lysophosphatidylcholines (24)
- Sphingomyelins (31)
- Ceramides (9)
- Acylcarnitines (55)
- Cholesteryl esters (14)
- Diglycerides (18)
- Triglycerides (42)

Bioinformatics & Statistics



Integrated Bioinformatics Platform

OMICS DATA



PIPELINE



INSIGHTS



Genomics

(SNPs, Gene fusion, GWAS)



Epigenomics

(Methyl-seq, ChIP-seq)



Transcriptomics

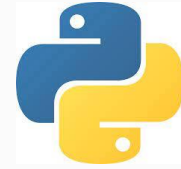
(Capture panels, Pathways/GO terms, DEGs, novel transcripts)



Single Cell

(cell composition, uncommon cells discovery, cell biomarkers, spatial transcriptomics)

nextflow



10X
GENOMICS



Partek®
Flow®



kallisto



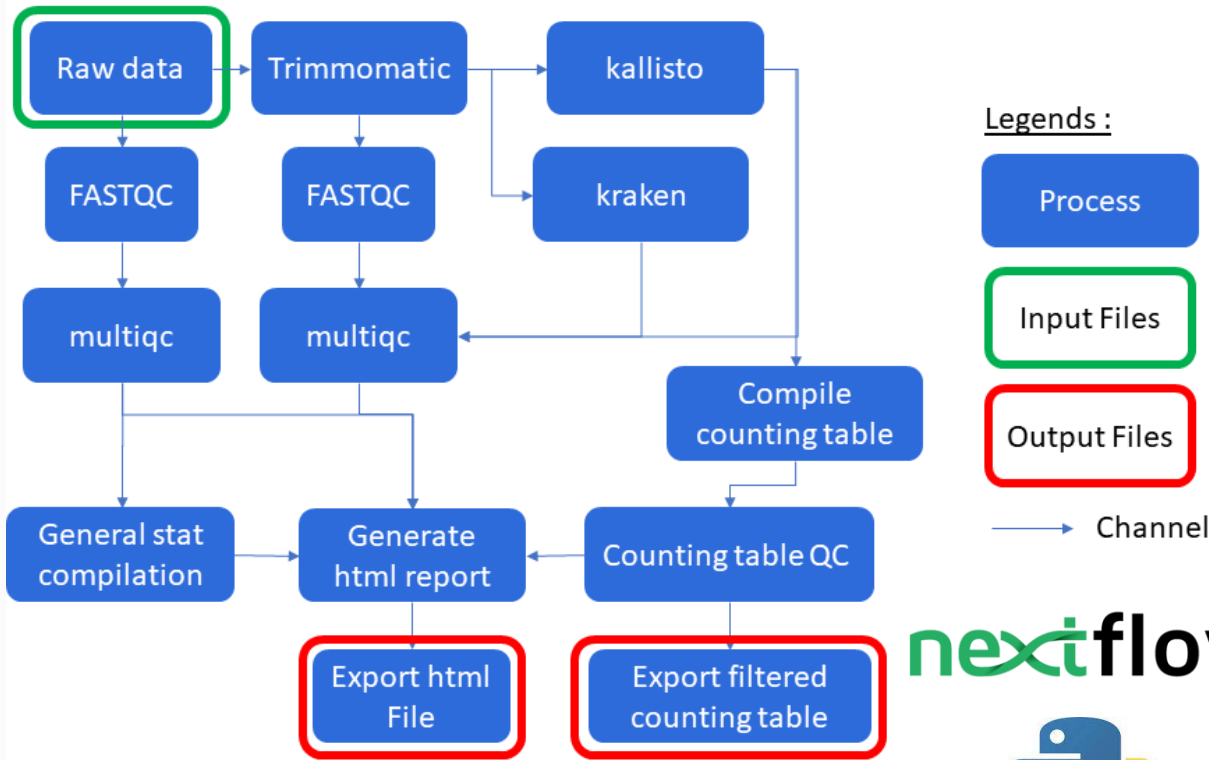
Standard analysis

QA/QC, reporting

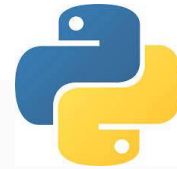


Custom analysis

Biological/Clinical question



nextflow



FIRALink :FiMICS

FIRALink :NeuroLINCS

FIRALink :RNA-seq

Kallisto

Alignment with kallisto on the FiMICS panel

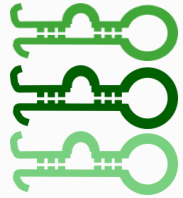
isoform 1	5	=5
isoform 2	13	=13

Counting only on the targeted region of each isoform -> counting is proportional to the real isoform expression

Annotation based: only known features

condition 1

condition 2



VS



- Mapping on known genome or transcriptome (ex: hg38)
- Differentially expressed annotated features (public or *de novo* annotations)



K-mers based: A complete and unbiased map of the transcriptome

ATAAGCGGTGTAACCGAATGC

read 1

AGCCGTGATGTAATGCAATGC

read 2

...

TTACCATAAGTTTCGTACCTG

read n



ATAA
ATAA
ATAA
ATAA

GCGG

TGTA

AAGC
AAGC

AGCG
AGCG
AGCG
AGCG

TAAG

Differential expression
→
Transcript identification

condition 1

AGCG
AGCG
AGCG
AGCG
AGCG

AGCG
AGCG
AGCG
AGCG
AGCG

condition 2

AGCG
AGCG

AGCG

AGCG
AGCG

VS

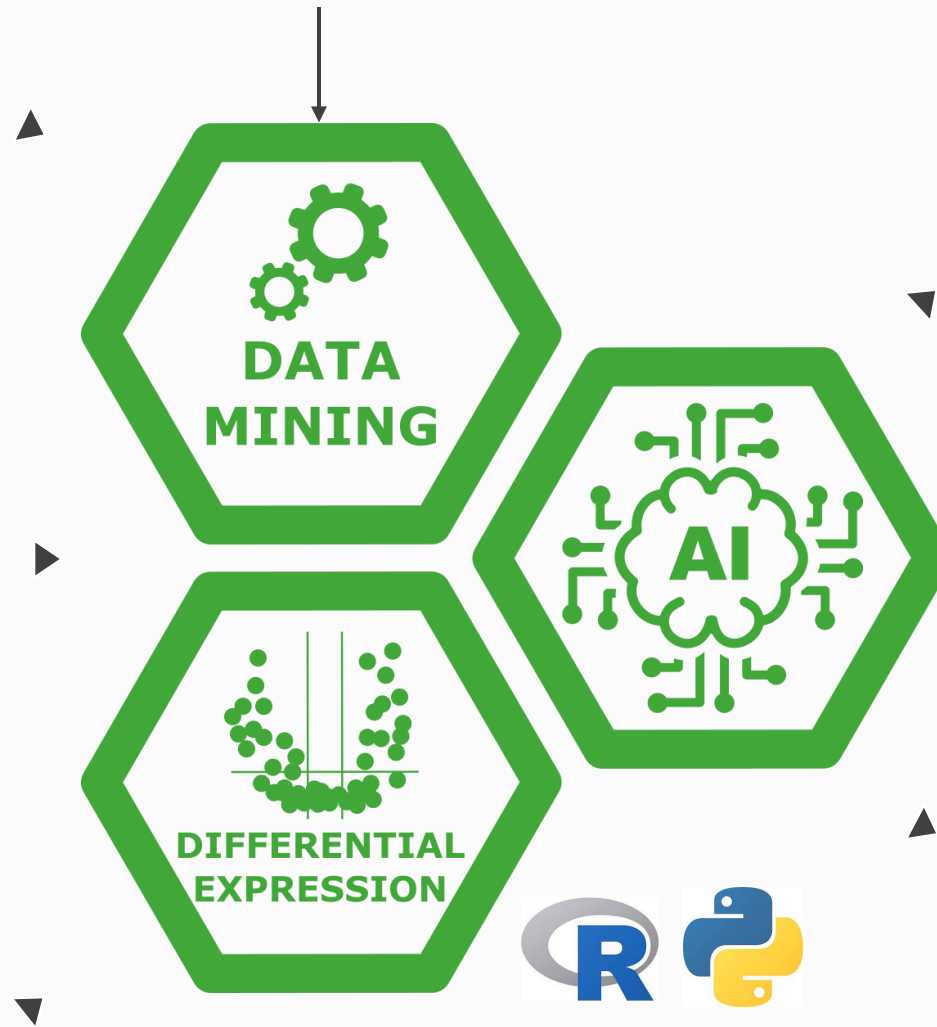
Content of which RNA?

- ✓ lncRNA
- ✓ mRNA
- ✓ HERV
- ✓ Other repeats

Multi-Source Data Integration

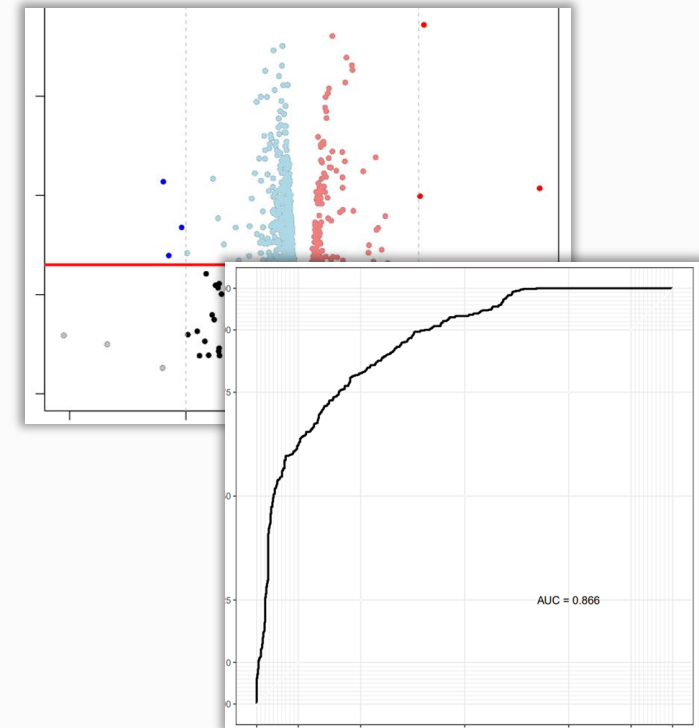


Pre-existing databases



Predictive Modelling

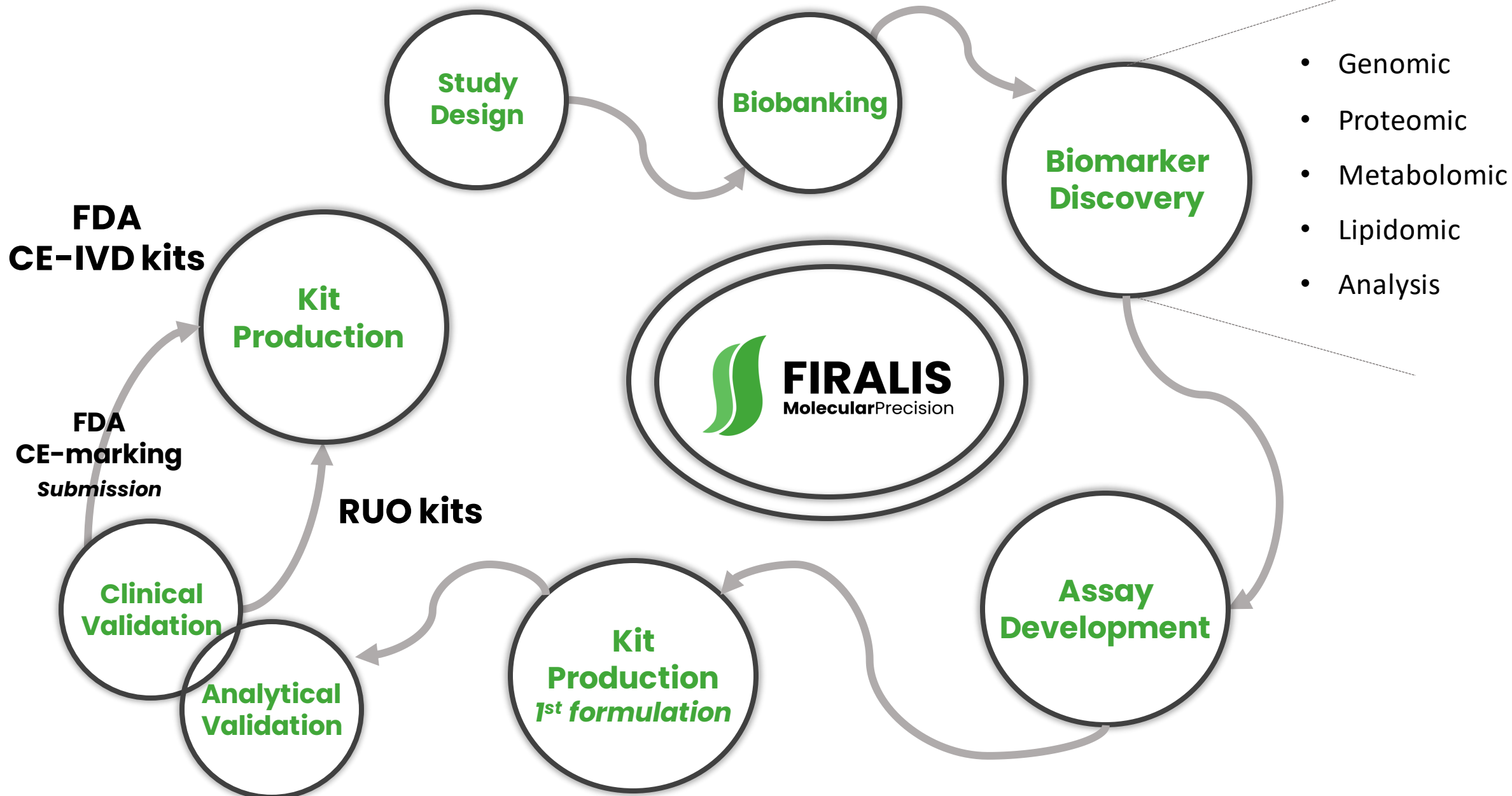
Signatures & Biomarkers
Discovery



Assay Development



End-to-End Workflow





FIRALIS
MolecularPrecision

Thanks!

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FIRALIS