IAB Onco

The IAB Onco test offers high-quality and affordable results generated using TruSight Oncology 500 Illumina. The data analysis and data interpretation are powered by PierianDx software and expert bioinformatics services.

Introduction

The IAB Onco represents a powerful assay enabling the comprehensive genomic profiling of DNA variants (523 genes) and RNA (55 genes) implicated in various tumor types. Complex assay (SNVs, InDels, fusions, splice variants, TMB, MSI) corresponding to a given tumor type can be evaluated in parallel from the same sample.

IAB Expertise

The IAB team´s experiences with the TSO500 protocol are based on a number of optimisation experiments and precise laboratory work (**Fig. 1**). Simultaneous preparation of a good quality DNA and RNA highly is a comprehensive analysis and tumor characterisation. Using TSO500 ctDNA, we are able to detect tumor DNA in blood, even from very low DNA concentrations.

Material and Methods

Sample requirement

- Human DNA/RNA solid or tissue (including FFPE samples); blood
- RNA/DNA concentration: ≥ 5 ng/µl
- Minimum sample volume: 20 µl

Kit for library preparation

- TruSight Oncology 500 (Illumina)
- Relevant DNA/RNA variants in various tumor types (**Fig. 2**)
- Targeting 523 genes (55 RNA genes)
- 1.94 Mb panel including MSI and TMB biomarkers
- Analytical specificity >99,99%

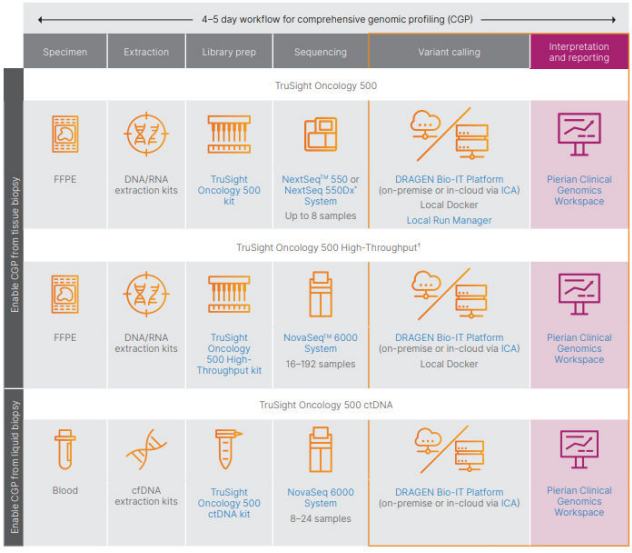


Figure 1 Workflow for comprehensive genomic profiling (CGP)

Institute of Applied Biotechnologies a.s.
Služeb 3056/4, 108 00 Praha-Strašnice, Tel: +420 210 323 429, www.iabio.eu, E-mail: iabio@iabio.eu

Figure 2 TSO500 library preparation and hybridization workflow

Sequencing

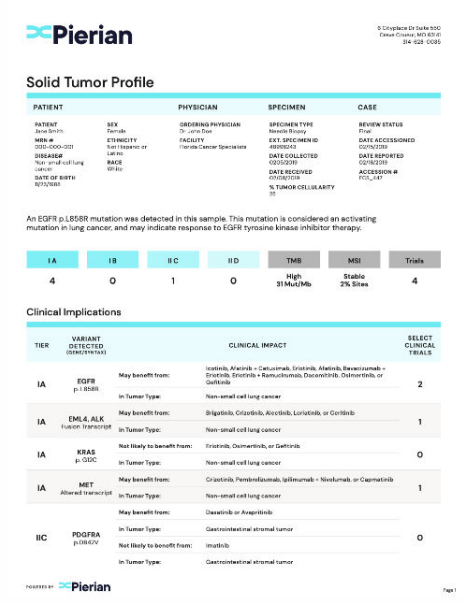
- NextSeq 500, High Output / NovaSeq X Plus for TSO500 ctDNA (Illumina)
- Pair-end sequencing > 2×100 bp
- Internal standard – PhiX Spike-in
- BaseSpace Sequencing Hub for data storage and sharing

Data QC

- Guaranteed Phred Q30> 80 % bases (sequencing mode 2x100bp)
- IAB recommends a minimum of 80 M/DNA and 20 M/RNA reads per sample (800 M reads for ctDNA)

Bioinformatic analysis

- Quality control and data filtering
- DNA-seq Analysis Somatic Variants
- Tumor Burden Mutation and MSI
- RNA-Seq Gene fusions
- PierianDX – Complete clinical genomic solution


Pierian

Solid Tumor Profile

PATIENT | PHYSICIAN | SPECIMEN | CASE

An EGFR p.L858R mutation was detected in this sample. This mutation is considered an activating mutation in lung cancer, and may indicate response to EGFR tyrosine kinase inhibitor therapy.

IA	IB	IIC	IID	TMB	MSI	Trials
4	0	1	0	High 31 Mut/Mb	Stable 2% Sites	4

Clinical Implications

TIER	VARIANT DETECTED	CLINICAL IMPACT	SELECT CLINICAL TRIALS
IA	EGFR p.L858R	May benefit from: Icotinib, Afatinib + Cetuximab, Erlotinib, Afatinib, Bevacizumab + Erlotinib, Erlotinib + Ramucirumab, Dacomitinib, Osimertinib, or Gefitinib	2
		In Tumor Type: Non-small cell lung cancer	
IA	EML4, ALK fusion transcript	May benefit from: Brigatinib, Crizotinib, Alectinib, Loriatinib, or Ceritinib	1
		In Tumor Type: Non-small cell lung cancer	
IA	KRAS p.G12C	Not likely to benefit from: Erlotinib, Osimertinib, or Gefitinib	0
		In Tumor Type: Non-small cell lung cancer	
IA	MET Altered transcript	May benefit from: Crizotinib, Pembrolizumab, Ipilimumab + Nivolumab, or Capmatinib	1
		In Tumor Type: Non-small cell lung cancer	
IIC	PDGFRA p.D842V	May benefit from: Dasatinib or Avapritinib	0
		In Tumor Type: Gastrointestinal stromal tumor	
		Not likely to benefit from: Imatinib	
		In Tumor Type: Gastrointestinal stromal tumor	

Pierian

Figure 3 Clinical report generated from Pierian DX software (Illumina)

Results

Sequencing results show excellent uniformity of NGS data output. Rapid data analysis, including interpretation, is performed using PierianDx software by expert bioinformaticians.

Conclusions

Complex NGS assay targeting 523 genes identifying all relevant DNA and RNA variants implicating in various solid tumor types (**Fig. 4**). The test also includes key current immuno-oncology biomarkers: microsatellite instability (MSI) and tumor mutation burden (TMB). Hybrid-capture chemistry combined with sophisticated bioinformatics leads to high analytical specificity and sensitivity.

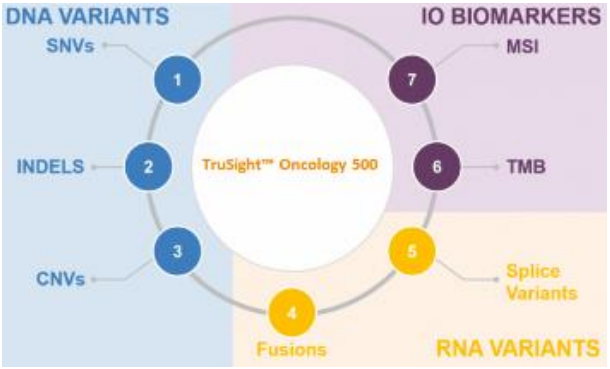


Figure 4

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About IAB

The experienced team follows IAB Onco workflow with strict quality procedures to perform the essential QC steps on your samples and generate reliable and repeatable results.

Certification

- *ČSN EN ISO 9001:2016*
- *ČSN EN ISO 13485 ed. 2:2016*

Illumina

Illumina is a global leader in sequencing and array technologies that are fueling groundbreaking advancements in life science research, translational and consumer genomics, and molecular diagnostics.

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