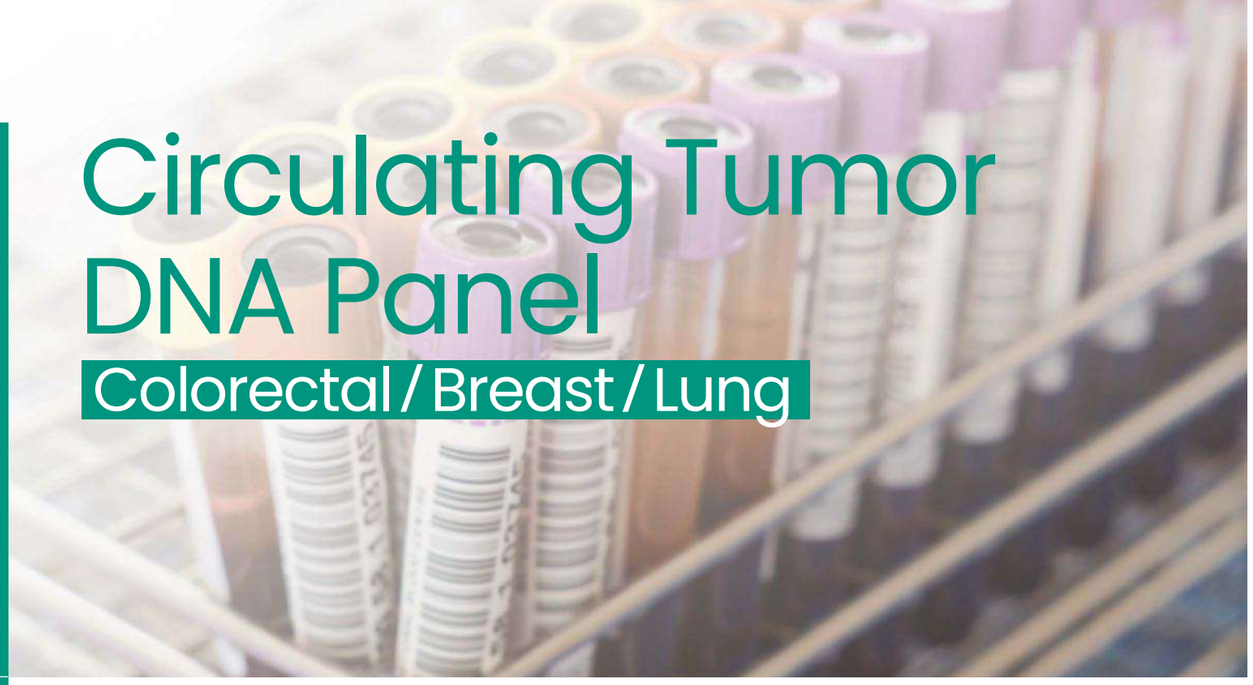


Circulating Tumor DNA Panel

Colorectal / Breast / Lung

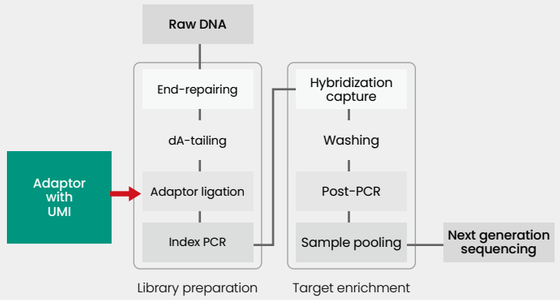
OVERVIEW

The detection sensitivity for low-frequency variants from a limited amount of sample is of great importance to ctDNA analysis kits. Celemics has developed ctDNA kits for colon, breast, and lung cancer assay through collaborative research with Seoul National University Hospital (SNUH) since 2017. We have integrated our market-leading proprietary technologies including probe design algorithms, noise removal techniques, and reagents optimization. The panels are thoroughly validated and ready to use for clinical diagnosis.

KEY FEATURES

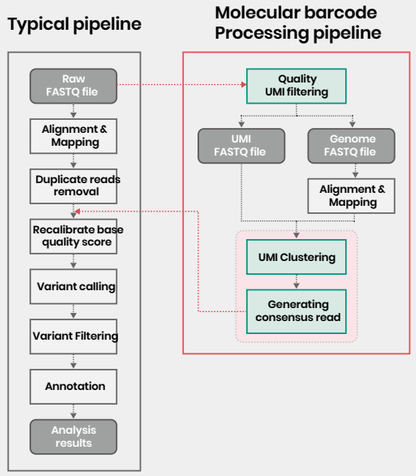
1. Detects ctDNA for colorectal cancer, breast cancer, and lung cancer	Assess 16 key genes for colorectal cancer, 27 for breast cancer, 28 for lung cancer
2. Highly optimized panel for clinical testing with exceptional accuracy	Complete validated panel performance conducted with patient samples through collaborative research with Seoul National University Hospital
3. Provides Unique Molecular Identifiers (UMI) and Bioinformatics Software	Receive high-quality data supported by Celemics proprietary UMI algorithms and analysis software, enabling efficient duplication removal and minimizing sequencing noise

MODULAR UNIQUE MOLECULAR IDENTIFIER



1. Able to assess ctDNA with ultra-low variant allele frequency (VAF)
2. Retrieves more unique reads than that from conventional duplication removal algorithm, reducing sequencing costs
3. Noise removal and accurate calls possible due to proprietary consensus sequence generation algorithm
4. Modular algorithm to be applied to the existing pipeline.

MODULAR BIOINFORMATICS PIPELINE



1. Molecular Barcode Analysis Program provided to the customers using Celemics ctDNA Panels. (Linux, CLI program)
2. Streamlined application of the Molecular Barcode Analysis Program to the standard pipeline.

PACKAGE COMPOSITION

Package name	Compositions		
Target Enrichment	Target capture Probe	-	
Standard	Target Enrichment reagents	Library prep Kit	-
All-In-One			Beads / Polymerase

Package option	Options	
Pooling method	Single Reaction	Pre-capture Pooling
Library Preparation kits	Standard Kit	EP-kit
Hybridization Enhancer	Included	Not included

Circulating-tumor DNA Colorectal Cancer Panel

SPECIFICATION

Gene count*	16 genes
Covered region	Whole CDS
Target size	18 kb
Mutation type	SNV, Indel
Sample type (amount)	Plasma (> 20 ng of cfDNA)
Platform	All sequencers from Illumina and MGI
Bioinformatics pipeline	1. Primary and Secondary analysis result (FASTQ to VCF) 2. Tertiary analysis result (VCF to Clinical report) 3. Linux-based consensus read generation software provided

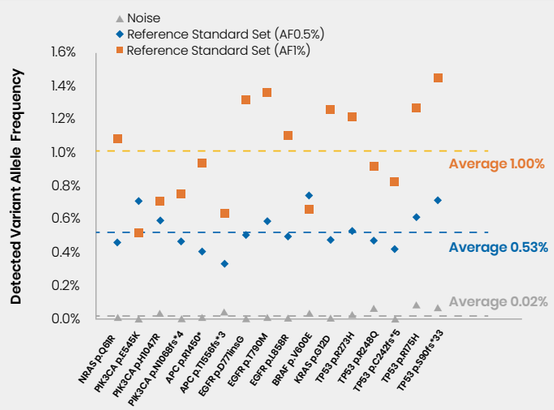
* Gene Add-On Service: Genes can be added by customer's request

GENE LIST

ctDNA Panel Colorectal Cancer	APC	BRAF	EGFR	ERBB2	ERBB3	FGFR1	HRAS	IRS1	KRAS	KRAS	MET	NRAS	PDGFRB
	PIK3CA	PTEN	TP53										

PANEL PERFORMANCE

Detection of 16 variants with 100% sensitivity and 97.9% specificity at 0.5% VAF and 1% VAF



Sensitivity, VAF 0.5%	100%
Sensitivity, VAF 1.0%	100%
Specificity	97.9%

Circulating-tumor DNA Breast Cancer Panel

SPECIFICATION

Gene count*	27 genes
Covered region	Whole CDS
Target size	99 kb
Mutation type	SNV, Indel
Sample type (amount)	Plasma (> 20 ng of cfDNA)
Platform	All sequencers from Illumina and MGI
Bioinformatics pipeline	1. Primary and Secondary analysis result (FASTQ to VCF) 2. Tertiary analysis result (VCF to Clinical report) 3. Linux-based consensus read generation software provided

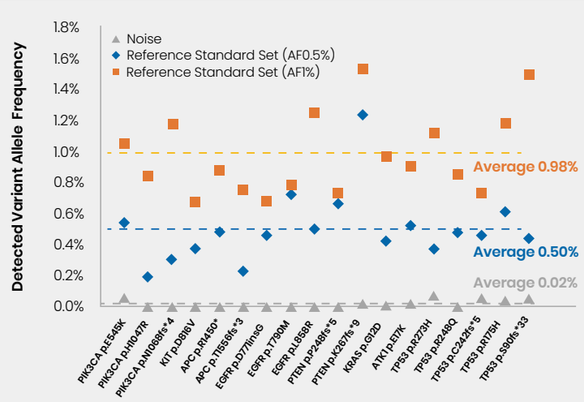
* Gene Add-On Service: Genes can be added by customer's request

GENE LIST

ctDNA Panel Breast Cancer	AKT1	APC	AR	BRCA1	BRCA2	CCND1	CDH1	EGFR	ERBB2	ESR1	FGFR1	FGFR2	GATA3
	IGF1R	KIT	KRAS	MAP2K4	MAP3K1	MDM2	MYC	NF1	PIK3CA	PIK3R1	PTEN	RB1	TOP2A
	TP53												

PANEL PERFORMANCE

Detection of 27 variants with 96.3% specificity and 94.4% sensitivity at 0.5% VAF and 100% at 1% VAF



Sensitivity, VAF 0.5%	94.4%
Sensitivity, VAF 1.0%	100%
Specificity	96.3%

Circulating-tumor DNA Lung Cancer Panel

SPECIFICATION

Gene count*	28 genes
Covered region	Whole CDS
Target size	47 kb
Mutation type	SNV, Indel
Sample type (amount)	Plasma (> 20 ng of cfDNA)
Platform	All sequencers from Illumina and MGI
Bioinformatics pipeline	1. Primary and Secondary analysis result (FASTQ to VCF) 2. Tertiary analysis result (VCF to Clinical report) 3. Linux-based consensus read generation software provided

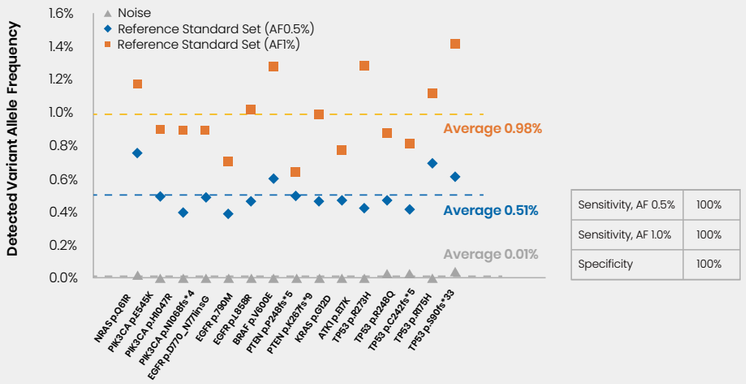
* Gene Add-On Service: Genes can be added by customer's request

GENE LIST

ctDNA Panel Lung Cancer	AKT1	ALK	ARAF	ARID1A	BRAF	CBL	CDKN2A	EGFR	ERBB2	HRAS	KEAP1	KRAS	MAP2K1
	MET	MTOR	NF1	NRAS	NTRK1	NTRK2	PIK3CA	PTEN	RB1	RIT1	ROS1	SETD2	STK11
	TP53	U2AF1											

PANEL PERFORMANCE

Detection of 28 variants with 100% sensitivity and 100% specificity at 0.5% VAF and 1% VAF detection



Sensitivity, AF 0.5%	100%
Sensitivity, AF 1.0%	100%
Specificity	100%