Tell your oncologist about the Oncomine Dx Target Test

A paradigm change in testing for targeted therapies in NSCLC, cholangiocarcinoma, and thyroid cancer

FDA approved

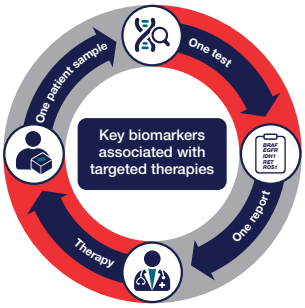
This test is reimbursed by Medicare and over 40 commercial payers, covering more than 200 million US enrollees.

The Ion Torrent™ Oncomine™ Dx Target Test is the first targeted next-generation sequencing (NGS) *in vitro* diagnostic test for non-small cell lung cancer (NSCLC), cholangiocarcinoma (CC), medullary thyroid cancer (MTC), and thyroid cancer (TC), simultaneously delivering multiple biomarker results for multiple targeted therapies from one sample within four days.

- **Identify patients who are candidates for multiple therapies**—one test indicated as a companion diagnostic (CDx) device to aid in selecting NSCLC, CC, and TC patients for treatment with targeted therapies (Table 1)
- **Multiple biomarkers from one limited sample**—one test for detection of 23 genes, minimizing the risk of depleting tissues and requiring additional biopsies; based on Ion AmpliSeq™ technology, the required input is as low as 10 ng of DNA and 10 ng of RNA
- **One workflow, helps save time**—laboratory results can be generated within 4 days

Table 1. List of genes for therapeutic use.

Cancer type	Gene	Targeted therapies
NSCLC	*BRAF*	TAFINLAR® (dabrafenib) in combination with MEKINIST® (trametinib)
	EGFR L858R and exon 19 deletions	IRESSA® (gefitinib)
	EGFR exon 20 insertions	EXKIVITY™ (mobocertinib)
		RYBREVANT™ (amivantamab-vmjw)
	ERBB2/HER2 activating mutations (SNVs and exon 20 insertions)	ENHERTU® (fam-trastuzumab deruxtecan-nxki)
	RET	GAVRETO™ (pralsetinib) RETEVMO® (selpercatinib)
	ROS1	XALKORI® (crizotinib)
CC	*IDH1*	TIBSOVO® (ivosidenib)
MTC	*RET* mutations (SNVs, MNVs, and deletions)	RETEVMO® (selpercatinib)
TC	*RET* fusions	RETEVMO® (selpercatinib)



- **Established performance**—concordance with FDA-approved or -validated reference methods based on fluorescence *in situ* hybridization (FISH), PCR, Sanger sequencing, or NGS was established for all CDx biomarkers (excluding no-calls or unknowns):
  - 100% overall percent agreement (OPA), positive percent agreement (PPA), and negative percent agreement (NPA) for *BRAF* mutation, *EGFR* exon 20 insertions, and *ROS1* fusions
  - 99% OPA, PPA, and NPA for *EGFR* exon 19 deletions and L858R
  - 99% OPA, PPA, and NPA for *EGFR* exon 19 deletions and L858R 99% OPA, 100% PPA, and 99% NPA for *ERBB2/HER2* activating mutations (SNVs and exon 20 insertions)
  - 92% OPA, 91% PPA, and 92% NPA in the first study and 95% OPA, 92% PPA, and 97% NPA in the second study for *RET* fusions in NSCLC
  - 98% OPA, 99% PPA, and 97% NPA for *IDH1* mutations
  - 99% OPA, 100% PPA, and 98% NPA for *RET* mutations in MTC and 100% OPA, PPA, and NPA for *RET* fusions in TC

For *In Vitro* Diagnostic Use.

A complete and flexible system

The Oncomine Dx Target Test is used in conjunction with the Ion PGM™ Dx System, which includes a complete NGS system of instruments, reagents, and software, now validated with the Oncomine Dx Target Test for somatic mutation reporting for formalin-fixed, paraffin-embedded (FFPE) samples (see Figure 1 for workflow). The Ion PGM Dx sequencing system is a Class II Medical Device and incorporates combined functionality with both "IVD Mode" for molecular diagnostic tests and "Assay Development Mode" for clinical research. The system also facilitates 21 CFR Part 11 compliance with role-based workflows, sample and reagent tracking, QC metrics, and audit trails.

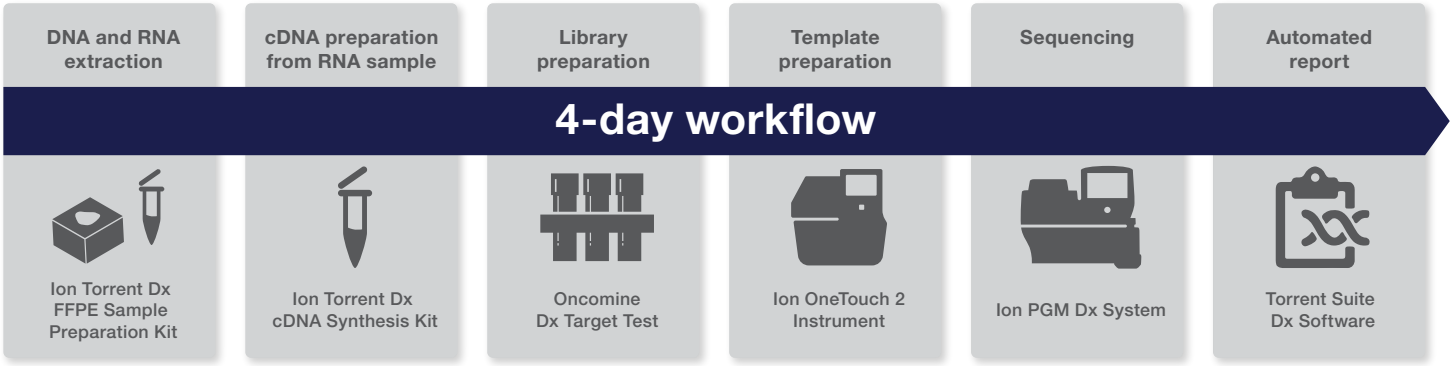


Figure 1. The Oncomine Dx Target Test utilizes a single streamlined NGS workflow for detecting cancer-associated biomarkers, incorporating reagents, instrument systems, and bioinformatics. The turnaround time, from FFPE sample to report, is 4 days.

Oncomine Dx Target Test—gene content

The Oncomine Dx Target Test includes targets for cancer-associated genes. Nine targets are companion diagnostics to aid in selecting patients for approved targeted therapies including six for NSCLC, one for CC, one for TC, and one for MTC, while remaining genes are currently being investigated in clinical trials and may be potentially actionable in the future as referenced in Table 2.

Table 2. Complete list of gene targets for the Oncomine Dx Target Test.

NSCLC				
Gene targets for therapeutic use				
BRAF: V600E	*EGFR*: L858R, exon 19 deletions, and exon 20 insertions	*ROS1*: fusions	*RET*: fusions	
ERBB2/HER2: activating mutations (SNVs and exon 20 insertions)				
Analytically validated targets				
KRAS	*MET**	*PIK3CA*		
Additional targets**				
AKT1	*ERBB2*	*HRAS*	*MTOR*	*RET*
*ALK**	*ERBB3*	*KIT*	*NRAS*	*ROS1*
CDK4	*FGFR2*	*MAP2K1*	*PDGFRA*	
DDR2	*FGFR3*	*MAP2K2*	*RAF1*	
CC				
Gene targets for therapeutic use				
IDH1: mutations				
MTC				
Gene targets for therapeutic use				
RET: mutations				
TC				
Gene targets for therapeutic use				
RET: fusions				

* The test reports fusion/translocation variants for *ROS1* and *RET* only. The test only reports mutations for *ALK* and *MET*.
** Performance for the additional gene target variants has been validated based on a representative method.

Oncomine Dx Target Test—report

The Oncomine Dx Target Test report is automatically generated as a PDF and incorporates relevant patient, sample, and test information required to help ensure high performance standards, regulatory compliance, and quality control. The test results are presented in two parts: companion diagnostic biomarker results with associated therapy indications (Figure 2), and other analytically detected biomarker results in a separate section (not shown). The report is compatible with the laboratory information management system (LIMS).

Sequence variations to indicate therapeutic use for NSCLC (for illustrative purposes only; *EGFR*, *BRAF*, *ERBB2*, *ROS1*, and *RET* are mutually exclusive)

DNA sequence variants						
Gene	Display name	Amino acid change	Nucleotide change	Test result	Hotspot ID	Associated therapy
EGFR	*EGFR* L858R	p.Leu858Arg	c.2573T>G	POSITIVE	COSM6224	IRESSA® (gefitinib)
EGFR	*EGFR* exon 20 insertions	p.Ala767_Ser768insSerValAsp	c2311_2312insGCGTGGACA	POSITIVE	COSM13428	EXKIVITY™ (mobocertinib) RYBREVANT™ (amivantamab-vmjw)
BRAF	*BRAF* V600E	p.Val600Glu	c.1799T>A	POSITIVE	COSM476	TAFINLAR® + MEKINIST® (dabrafenib in combination with trametinib)
ERBB2	*ERBB2* exon 20 insertions	p.Gly776delinsLeuCys	c.2326_2326delGinsCTTT	POSITIVE	COSM12554	ENHERTU® (fam-trastuzumab deruxtecan-nxki)
Gene fusions (RNA)						
Gene	**Display name**			**Test result**		**Associated therapy**
ROS1	*ROS1* fusions			POSITIVE		XALKORI® (crizotinib)
RET	*RET* fusions			POSITIVE		GAVRETO™ (pralsetinib) RETEVMO® (selpercatinib)

Sequence variation to indicate therapeutic use for CC (for illustrative purposes only)

DNA sequence variant						
Gene	Display name	Amino acid change	Nucleotide change	Test result	Hotspot ID	Associated therapy
IDH1	*IDH1* R132G	p.Arg132Gly	c.394C>G	POSITIVE	COSM28749	TIBSOVO® (ivosidenib)

Sequence variation to indicate therapeutic use for MTC (for illustrative purposes only)

DNA sequence variant						
Gene	Display name	Amino acid change	Nucleotide change	Test result	Hotspot ID	Associated therapy
RET	*RET* A883T	p.Ala883Thr	c.2647G>A	POSITIVE	COSM100081	RETEVMO® (selpercatinib)

Sequence variation to indicate therapeutic use for TC (for illustrative purposes only)

DNA sequence variant			
Gene	Display name	Test result	Associated therapy
RET	*RET* fusions	POSITIVE	RETEVMO® (selpercatinib)

Figure 2. Example of Oncomine Dx Target Test report format. The report includes a section with results of the validated biomarkers and information about relevant treatment indication, as well as a separate section with the other biomarkers not validated for treatment selection (not shown).

Learn more at **thermofisher.com/oncomine-dxtarget**