THE PATHCARE NEWS

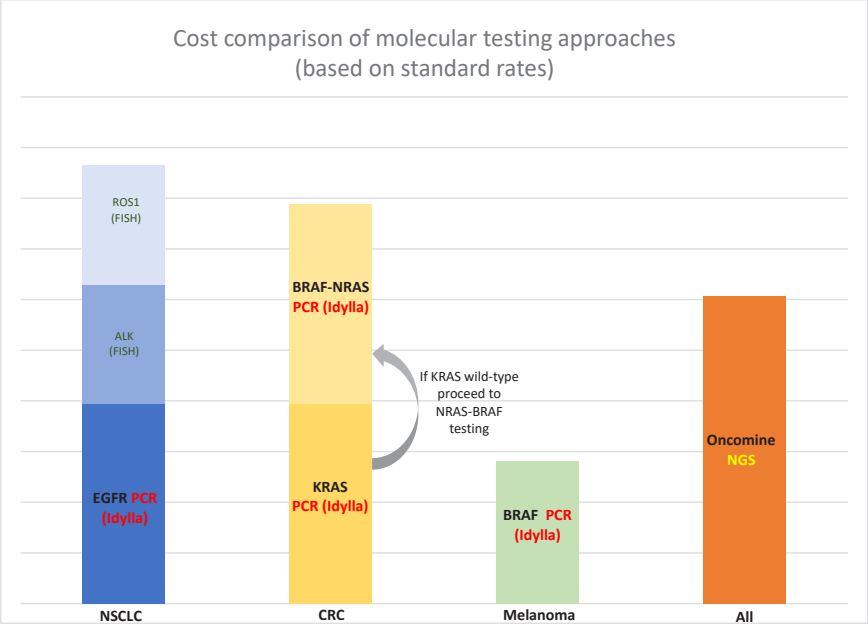
IDYLLA: ADVANCES IN SINGLE-GENE TESTING FOR PRECISION ONCOLOGY

Rapid advances in the understanding of solid tumours has lead to exponential growth in the development of molecularly-targeted therapies. Patients with tumours harbouring specific mutations may be candidates for specific therapies. Additionally, molecular testing can aid in prognostic stratification or identification of treatment-resistant tumours. Due to these advances, molecular testing has been incorporated into international guidelines[1-4].

Testing of molecular markers for the more common solid tumours such as colorectal cancer (CRC) or non-small-cell lung carcinoma (NSCLC) can follow one of two approaches: broad panel-based testing of multiple genes via next generation sequencing (NGS) or a step-wise testing approach of single gene markers via real-time PCR. Molecular testing of stage III/IV melanoma has traditionally been limited to BRAF analysis, however, broader testing for other molecular targets and prognostic indicators (such as NRAS, KIT, NTRK, ROS-1 and ALK[5]) are likely to become of value. PathCare can facilitate both testing approaches, via the Solid tumour NGS panel (Oncomine Focus) or through single-gene EGFR, BRAF, KRAS or NRAS tests.

The Solid tumour NGS assay was established within PathCare in 2019, and offers a broad 52-gene based assay to test for all genes of interest (see table below). To aid in single-gene testing, PathCare has recently been established as a reference centre for the Idylla platform from Biocartis. Idylla is a fully automated, sample-to-result PCR based molecular diagnostics system which can enable the delivery of results within 24 hours of sample receipt within the PathCare molecular laboratory. The advantage of single-gene testing lies in the short turnaround time and potential cost-saving if a step-wise testing approach is followed. However, NGS remains the most comprehensive and cost-effective test for multiple gene targets.

In addition to this the Idylla platform also allows for analysis of circulating tumour DNA (so called liquid biopsy) for EGFR mutations. PathCare is in the process of validating this test which will be available in the third quarter of 2021.



Advantages of single-gene tests	Advantages of NGS panels
Quick turnaround time	Comprehensive, includes all genes of interest
Can save costs if a step-wise approach is followed	Most cost-effective option for testing multiple genes

How to arrange a molecular oncology test:

- Complete the PathCare molecular oncology request form and email to your local histopathologist or histopathology laboratory.

Available Idylla single gene tests (FFPE tissue):

- **BRAF** (BRAF V600E/E2/D and V600K/R/M mutations)
- **KRAS** (KRAS mutations in codons 12, 13, 59, 61, 117 or 146v)
- **NRAS-BRAF** (NRAS mutations in codons 12, 13, 59, 61, 117, 146 and mutations codon 600 of the BRAF gene)
- **EGFR** (exon 18 (G719A/C/S), exon 21 (L858R, L861Q), exon 20 (T790M, S768I) mutations, exon 19 deletions and exon 20 insertions in the EGFR oncogene)

Available Idylla single gene tests (plasma/liquid biopsy, available Q3 2021):

- **ctEGFR** (detection of exon 18 (G719A/C/S), exon 20 (T790M, S768I) and exon 21 (L858R, L861Q) mutations, exon 19 deletions and exon 20 insertions in the EGFR gene in circulating tumor DNA (ctDNA))

Oncomine Focus assay genes

DNA Panel				RNA Panel	
Hotspot analysis - 35 genes		Copy Number Variant (CNV) analysis – 19 genes		Fusion driver analysis – 23 genes	
AKT1	IDH1	ALK	FGFR3	ABL1	FGFR2
ALK	IDH2	AR	FGFR4	AKT3	FGFR3
AR	JAK1	BRAF	KIT	ALK	MET
BRAF	JAK2	CCND1	KRAS	AXL	NTRK1
CDK4	JAK3	CDK4	MET	BRAF	NTRK2
CTNNB1	KIT	CDK6	MYC	ERG	NTRK3
DDR2	KRAS	EGFR	MYCN	ETV1	PDGFRA
EGFR	MAP2K1	ERBB2	PDGFRA	ETV4	PPARG
ERBB2	MAP2K2	FGFR1	PIK3CA	ETV5	RAF1
ERBB3	MET	FGFR2		EGFR	RET
ERBB4	MTOR			ERBB2	ROS1
ESR1	NRAS			FGFR1	
FGFR2	PDGFRA				
FGFR3	PIK3CA				
GNA11	RAF1				
GNAQ	RET				
HRAS	ROS1				
	SMO				

Hotspots only · CNVs only · Fusions only · Hotspot & CNVs
Hotspot & CNVs & Fusions · Hotspot & Fusions · CNV & Fusions

If you require any additional information, please email molecularoncology@pathcare.co.za, or contact the following:

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