Taipei Veterans General Hospital

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Sample Information

Patient Name: 魏可吟
Gender: Male
ID No.: A101603748
History No.: 41468375
Age: 71

Ordering Doctor: DOC3160J 羅永鴻
Ordering REQ.: D6BPAHP
Signing in Date: 2021/07/22

Path No.: S110-99145
MP No.: F21059
Assay: Oncomine Focus Assay
Sample Type: FFPE
Block No.: S110-76683A
Percentage of tumor cells: 40%

Reporting Doctor: DOC5466K 葉奕成 (Phone: 8#5466)

Note:

Sample Cancer Type: Other Solid Tumor

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Report Highlights

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Relevant Biomarkers

No relevant biomarkers found in this sample.

Prevalent cancer biomarkers without relevant evidence based on included data sources
KIT p.(D820G) c.2459A>G

Variants (Exclude variant in Taiwan BioBank with >1% allele frequency)

DNA Sequence Variants

Gene	Amino Acid Change	Coding	Variant ID	Locus	Allele Frequency	Transcript	Variant Effect	Coverage
KIT	p.(D820G)	c.2459A>G	COSM1316	chr4:55599333	37.75%	NM_000222.3	missense	2000

Biomarker Descriptions

KIT (KIT proto-oncogene, receptor tyrosine kinase)

Background: The KIT gene, also known as CD117, encodes the KIT proto-oncogene receptor tyrosine kinase (c-KIT), a member of the PDGF receptor type III receptor tyrosine kinase family, which includes PDGFRA, PDGFRB, CSF1R, FLT1, FLT3, FLT4 and KDR[1,2]. KIT is a receptor for stem cell factor, important in regulating growth and development of hematopoietic cells[3]. The KIT gene is flanked by the PDGFRA and KDR genes on chromosome 4q12. Ligand binding to KIT results in kinase activation and stimulation of downstream pathways including the RAS/RAF/MEK/ERK and PI3K/AKT/MTOR pathways promoting cell proliferation and survival[4].

Alterations and prevalence: Recurrent somatic KIT alterations are observed in both solid and hematological cancers and include activating mutations such as single nucleotide variants, small duplications, and complex in-frame insertions or deletions (indels). Mutations in KIT exons 8, 9, 11, and 17 disrupt auto-inhibitory mechanisms and lead to constitutive activity[5]. Gain of function mutations are found in up to 70% of mast cell tumors, 17% of nasal T-cell lymphomas, and 9% of dysgerminoma[6]. Somatic mutations in exon 11 occur in 60-70% of all gastrointestinal stromal tumor (GIST), whereas alterations in exons 8 and 17 are more common in myeloid cancers[5,6,7]. A common kinase domain mutation that causes ligand-independent constitutive activation, D816V, occurs in 80-93% of aggressive forms of mastocytosis[8,9].

Potential relevance: Imatinib[10] (2001) is approved for KIT positive malignant GIST and adult patients with aggressive systemic mastocytosis (SM) harboring D816V mutations. Imatinib is also recommended for KIT activating mutations in melanoma and exon 9 and 11 mutations in GIST[11,12,13]. Mutations in exon 17 have been identified to confer resistance to imatinib and sunitinib[14]. Patients with acute myeloid leukemia (AML) that harbor KIT activating mutations with t(8;21) and inv(16) have an increased risk of relapse[15]. KIT D816V mutation is associated with the diagnosis of SM and aggressiveness of the disease[16,17].

Clinical Trials in Taiwan region:

Signatures

Testing Personnel:

2021.07.23
15:32:25 +08'00'

Laboratory Supervisor:

2021.07.23
15:32:41 +08'00'

Pathologist:

2021.07.23
15:33:22 +08'00'

References

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