Taipei Veterans General Hospital

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Sample Information

Patient Name: 許慶瑞
Gender: Male
ID No.: N100579379
History No.: 42794025
Age: 76

Ordering Doctor: DOC8919E 周逸峰
Ordering REQ.: 0CCMHKF
Signing in Date: 2022/11/22

Path No.: M111-00014
MP No.: MY22034
Assay: Oncomine Myeloid Assay
Sample Type: Bone Marrow
Bone Marrow Aspirating Date: 2022/11/14

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

Note:

Sample Cancer Type: Chronic Myelomonocytic Leukemia

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Report Highlights

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Relevant Chronic Myelomonocytic Leukemia Variants

Gene	Finding
ASXL1	None detected

Relevant Biomarkers

No clinically significant biomarkers found in this sample.

Prevalent cancer biomarkers without relevant evidence based on included data sources
TET2 p.(Q255) c.763C>T, TET2 p.(K1500*) c.4498A>T*

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
TET2	p.(Q255*)	c.763C>T	.	chr4:106155862	6.80%	NM_001127208.2	nonsense	1999
TET2	p.(K1500*)	c.4498A>T	.	chr4:106194036	64.01%	NM_001127208.2	nonsense	1995
TET2	p.(V1371D)	c.4112T>A	.	chr4:106190834	14.63%	NM_001127208.2	missense	1155
SH2B3	p.(R551W)	c.1651C>T	.	chr12:111886029	49.92%	NM_005475.3	missense	1999
ZRSR2	p.(G268C)	c.802G>T	.	chrX:15836740	69.70%	NM_005089.3	missense	1307
ZRSR2	p.(S469=)	c.1407G>A	.	chrX:15841323	99.75%	NM_005089.3	synonymous	1596

Biomarker Descriptions

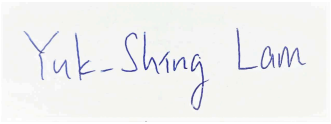
TET2 (tet methylcytosine dioxygenase 2)

Background: TET2 encodes the tet methylcytosine dioxygenase 2 protein and belongs to a family of ten-eleven translocation (TET) proteins that also includes TET1 and TET3[1]. TET2 is involved in DNA methylation, specifically in the conversion of 5-methylcytosine to 5-hydroxymethylcytosine[2,3]. The TET proteins contain a C-terminal core catalytic domain that contains a cysteine-rich domain and a double stranded ß-helix domain (DSBH)[4]. TET2 is a tumor suppressor gene. Loss of function mutations in TET2 are associated with loss of catalytic activity and transformation to hematological malignancies[1,2,3]

Alterations and prevalence: Somatic TET2 mutations, including nonsense, frameshift, splice site, and missense, are observed in 20-25% of myelodysplastic syndrome (MDS) associated diseases, including 40%-60% chronic myelomonocytic leukemia (CMML)[5]. TET2 mutations at H1881 and R1896 are frequently observed in myeloid malignancies[2,6]. TET2 mutations are also observed in 9% of uterine, 8% of melanoma and acute myeloid leukemia (AML), as well as 6% of diffuse large B-cell lymphoma (DLBCL).

Potential relevance: The presence of TET2 mutations may be used as one of the major diagnostic criteria in pre-primary myelofibrosis (pre-PMF) and overt PMF in the absence of JAK2/CALR/MPL mutations[7,8]. TET2 mutations are associated with poor prognosis in PMF and increased rate of transformation to leukemia[8,9]

Signatures

Testing Personnel: 

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Laboratory Supervisor: 
2022.11.25
18:23:30 +08'00'

Pathologist: 
2022.11.25
18:24:38 +08'00'

References

1. Pan et al. The TET2 interactors and their links to hematological malignancies. IUBMB Life. 2015 Jun;67(6):438-45. PMID: 26099018
2. Ko et al. Impaired hydroxylation of 5-methylcytosine in myeloid cancers with mutant TET2. Nature. 2010 Dec 9;468(7325):839-43. PMID: 21057493
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4. An et al. TET family dioxygenases and DNA demethylation in stem cells and cancers. Exp. Mol. Med. 2017 Apr 28;49(4):e323. PMID: 28450733
5. NCCN Guidelines® - NCCN-Myelodysplastic Syndromes [Version 3.2022]
6. Kosmider et al. TET2 mutation is an independent favorable prognostic factor in myelodysplastic syndromes (MDSs). Blood. 2009 Oct 8;114(15):3285-91. PMID: 19666869
7. Arber et al. The 2016 revision to the World Health Organization classification of myeloid neoplasms and acute leukemia. Blood. 2016 May 19;127(20):2391-405. PMID: 27069254
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9. Lundberg et al. Clonal evolution and clinical correlates of somatic mutations in myeloproliferative neoplasms. Blood. 2014 Apr 3;123(14):2220-8. PMID: 24478400