PRECIPIO EXPECT MORE
203-787-1717
203-901-1289

MOLECULAR

Patient: John A. Doe
DOB/Gender: 10/10/44 (74 yrs) - Male
Patient ID/MRN: 123456
Date Collected: 01/02/2024

Case# XX-00000
Status: Final
Report Category:
Detected

Provider: Jane Smith, M.D.
Hospital Oncology Center
Tel: 800-123-4567
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DIAGNOSIS:

Peripheral blood:
Bloodhound™ MPN results reveal:
- Negative for JAK2 V617F point mutation
- Negative for JAK2 exon 12 mutations
- Negative for JAK2 exon 13 (G571S) mutation
- Negative for MPL W515L/K point mutations
- **Positive for CALR exon 9 insertion mutation at 14.84%**
- Negative for CALR exon 9 deletion mutation

INTERPRETATION

Myeloproliferative neoplasms (MPNs) arise from issues stemming from the bone marrow which lead to abnormally high numbers of certain blood cell types in the blood. Classic MPNs include disorders such as polycythemia vera (PV; Red blood cells), essential thrombocythemia (ET; Platelets), and primary myelofibrosis (PMF; Fibers and blasts).1 Specific variants in the JAK2, CALR, and MPL genes (see above) are useful biomarkers for these diseases as they can play a role in either disease diagnosis or provide information regarding disease prognosis.2-5 These essentially mutually exclusive variants occur in a relatively high frequency, as 98% of sample with PV and 50-65% of samples with ET or PMF exhibit mutations in JAK2. Variants in CALR and MPL are observed in approximately 20-25% or 5-7% of both ET and PMF samples respectively, with only 10-15% of these samples exhibiting triple-negative morphology.1

The mutations covered:
MPL Exon 10: c.1544G>T; p.W515L ; c.1543_1544TG>AA; p.W515K
CALR Exon 9: c.1099_1150del; p.L367fs*46 ; c.1154_1155insTTGTC; p.K385fs*47
JAK2 Exon 12: c.1611_1616delTCACAA; p.F537_K539delinsL ; c.1624_1629delAATGAA; p. N542_E543del ; c.1615_1616delAAinsTT; p.K539L
JAK2 Exon 13: c.1711G>A; p.G571S
JAK2 Exon 14: c.1849G>T; p.V617F

REFERENCES:
1. Brown, V., S. Borinstein, D. Friedman. 2018. JAK2. My Cancer Genome https://www.mycancergenome.org/content/disease/myeloproliferative-neoplasms/jak2/?tab=0 (Copyright 2010-2017 MY CANCER GENOME)
2. Xia, D. and Hasserjian, R. P., Molecular testing for JAK2, MPL, and CALR in myeloproliferative neoplasms. PMID: 27727468; DOI: 10.1002/ajh.24578
3. I. Panovska-Stavridis, A. Eftimov, M. Ivanovski, A. Pivkova-Veljanovska, L. Cevreska, S. Hermouet, et al. Essential thrombocythemia associated with germline JAK2 G571S variant and somatic CALR type 1 mutation PMID: 27009537; DOI: 10.1016/j.clml.2016.02.039
4. Marchioli R., Finazzi G., Specchia G., Cacciola R., Cavazzina R., Cilloni D. Cardiovascular events and intensity of treatment in polycythemia vera

PMID: 23216616; DOI: 10.1056/NEJMoa1208500
5. Plo, Isabelle, and Caroline Marty. "Not just another kinase mutation!"
PMID: 31877214; DOI: 10.1182/blood.2019003650

METHOD:
Quantitative polymerase chain reaction (qPCR) is a technique in which the amount of PCR product can be determined during repeated cycles of DNA denaturation, annealing, and extension. This well-established method has been utilized to detect and quantify mutations in genes for diagnostic purposes where lower Ct values are associated with an increased initial copy number of the target. Controls enable quantitative results to be obtained and are included to ensure amplification. Amplification with this assay is based on chemistries that enhance mutation detection, therefore any variant present in the PCR product may differentiate from the Wild-Type (WT) DNA via Ct difference.

This assay can detect mutations with a minimum sensitivity of 0.5% MAF (mutant allele frequency) for JAK2 V617F and 2% MAF for CALR, MPL, JAK2 exon 12 and JAK2 exon 13. Although molecular testing is highly accurate, rarely false-positive and false-negative diagnostic errors may occur.

Analysis was performed using Bloodhound Auto-call software.

Electronically Signed By: Frank Bauer, MD, Precipio, Inc. (01/05/2024 15:39)

CLINICAL DATA

ICD-10: D75.9, D45. Polycythemia vera. New diagnosis.

Received CBC, reported on 12/29/2024: WBC 9.47; RBC 6.37; HGB 18.2; HCT 52.3; MCV 82.1; MCH 28.6; MCHC 34.8; RDW 12.7%; PLT 275; MPV 10.0; LYM 18.2%; GRAN NP; MID NP; MON 6.2%; NEU 73.4%; EOS 0.1%; BAS 0.5%; IMM GRAN 1.6%; (NP = not provided)

Disclaimer: The adequacy of staining is verified by the appropriate positive and negative controls. The reagents used for these assays (flow cytometry, cytogenetics, molecular, IHC & histology) are analyte specific reagents (ASR) or research use only (RUO). Their performance characteristics have been validated by Precipio, Inc., in its locations (New Haven, CT & Omaha, NE). They have not been reviewed by the FDA. The FDA has deemed that such approval is unwarranted. These assays are for clinical use and should not be viewed as experimental or "research use only". This laboratory is CLIA & CAP certified to perform high complexity clinical testing. Images that may be included within this report are representative of the patient but not all testing in its entirety and should not be used to render a result. For BM biopsy, IHC provides additional information for diagnosis that is not provided by Flow Cytometry and the samples for each procedure are derived from different specimens (biopsy and aspirate, respectively).

Patient: John A. Doe
Case #: XX-00000
Received Information: 2 green-top tube(s), 1 lavender-top tube(s)
Received: 01/03/2024 10:15
Reported: 01/05/2024 13:32