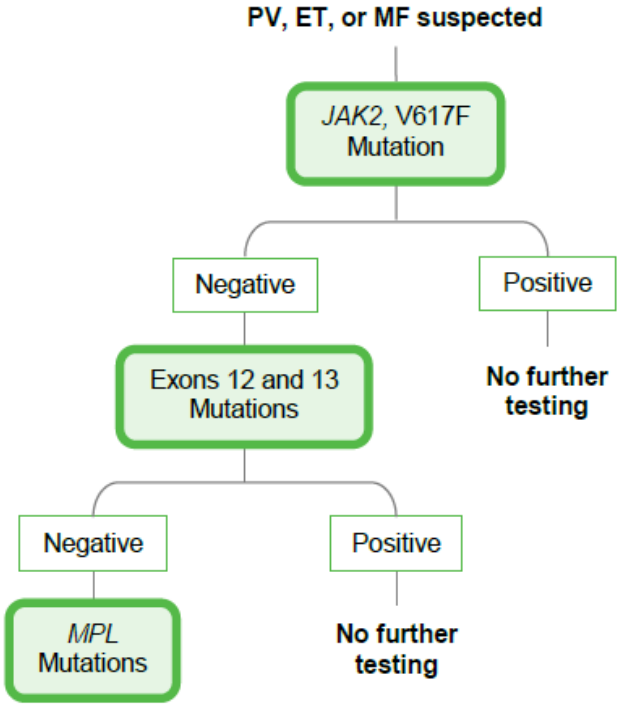
MYELOPROLIFERATIVE NEOPLASMS (MPNs)

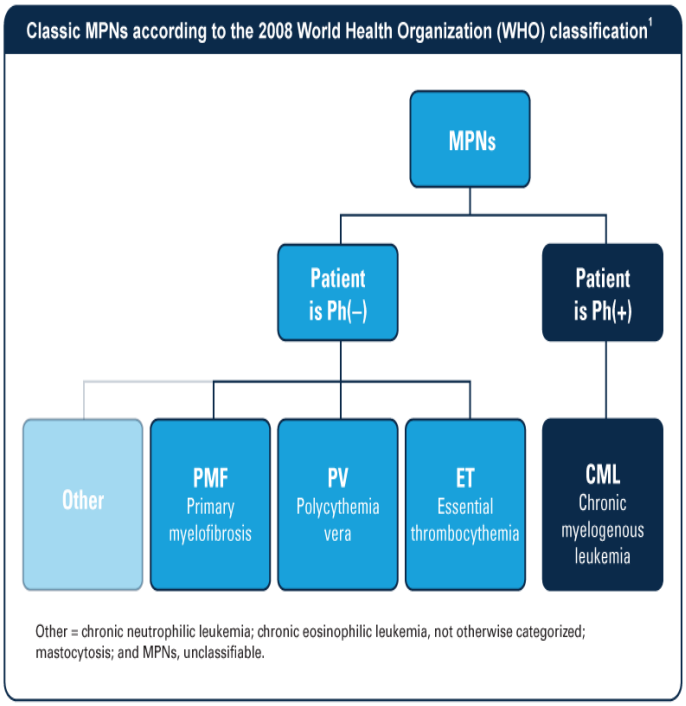
(The Diagnosis of BCR-ABL negative MPN)

Chronic myeloproliferative neoplasms (MPNs) are clonal hematopoietic stem cell malignancies characterized by excessive production of blood cells.

Essential thrombocythemia (ET), primary Myelofibrosis (PMF), and Polycythemia vera (PV)are the 3 most common BCR/ABL1-negative MPNs and are associated with thrombosis and hemorrhage, splenomegaly, and the risk of transformation to acute myeloid leukemia.

JAK2 V617F is one of the major criteria for the Diagnosis of ET, PMF, and PV according to the World Health classification of tumors of hematopoietic and lymphoid tissues,2008.





JAK2-V617F Mutation

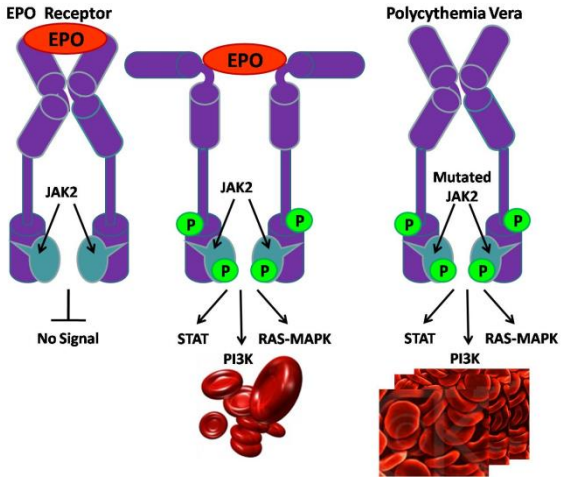
Janus Kinase 2 (also called JAK2) is a molecule involved in signal transduction in normal cells and in disease states. The name “Janus” was given after the two faced Roman god “Janus”. The abbreviation “JAK” is commonly referred to as “Just Another Kinase” because when it was discovered, it’s role was not fully understood.

JAK is a cytoplasmatic enzyme of the tyrosine kinase group of enzymes. The Janus Kinase 2 (JAK2) / Signal Transducers and Activators of Transcription (STAT) pathway influences cell proliferation, activation, migration and apoptosis.

The JAK-STAT pathway plays a central role in initiating signal transduction from the erythropoietin (Epo) receptor. In most patients with polycythemia vera (PV) the receptor is activated constitutively (i.e. all the time) due to lack of auto-inhibition of the JAK2 enzyme, because of an activating mutation involving an Amino acid substitution of valine to phenylalanine (V617F).

Clinical Use

- Diagnose polycythemia vera (PV), essential thrombocythemia (ET), and idiopathic myelofibrosis (MF)
- Monitor patients for therapeutic response and relapse (quantitative JAK2 V617F mutation analysis only)



JAK2 mutation as a diagnostic tool

The diagnostic value of detection of the JAK2 mutation in PV is pivotal and is a key feature recognized in the most recent WHO classification. In this system, identification of the JAK2 mutation and erythrocytosis are the 2 major criteria allowing PV diagnosis when a minor confirmatory criterion is also present (among the following: low serum erythropoietin level, BM biopsy findings, and the presence of endogenous erythroid colony formation).

JAK2 mutation & Monitoring Therapy

It has been shown that the mutational load is closely related to the clinical manifestations of myeloproliferative neoplasms. Mutational load also appears important in assessment of risk factors for the serious complications that may occur in the course of the disease. The evaluation of JAK2 mutational burden is not only helpful in establishing the diagnosis of MPN and differentiating it from benign myeloid disorders, but may be helpful in evaluating the prognosis.

METHODOLOGY:

The method used in this test is Real Time PCR (RT-PCR) using JAK2 MutaScreen Kit- Ipsogen, PCR testing.

Ordering Information:

Code	Test
356	JAK2-V617F

1- Jerald Z. Gong, James R. Cook, Timothy C. Greiner, et al.: Laboratory Practice Guidelines for Detecting and Reporting JAK2 and MPL Mutations in Myeloproliferative Neoplasms. The Journal of Molecular Diagnostics, Vol. 15, No. 6, November 2013

2- Jean-Jacques Kiladjian.: The spectrum of JAK2-positive myeloproliferative neoplasms. American Society of Hematology, 2012