Quantitative JAK2 c.1849G>T (p.V617F) Mutation in Myeloproliferative Neoplasms

The UNC Molecular Genetics Laboratory performs a molecular test to detect and quantify the JAK2 c.1849G>T (p.V617F) acquired mutation associated with myeloproliferative neoplasms (MPN), specifically polycythemia vera (PV), essential thrombocythemia (ET), and primary myelofibrosis (PMF).

Biology of the disease:
Somatic mutation c.1849G>T in exon 14 of the Janus kinase 2 gene (JAK2) has been identified as an oncogenic event and a molecular marker of PV, ET, and PMF. The vast majority of PV cases (> 95%), and about half of ET and PMF cases harbor the JAK2 c.1849G>T mutation. Homozygous or hemizygous mutation is often seen in PV and PMF, whereas heterozygous mutation is common in ET and is associated with a lower mutant allele burden. The mutation is specific for these (and a very low proportion of other) myeloproliferative or myelodysplastic diseases, meaning that a positive result is indicative of a clonal myeloid neoplasm while a negative result does not exclude any of these diseases.

Clinical Indications for JAK2 mutation testing:
Testing is recommended in patients suspected of having myeloproliferative neoplasia. This includes uncertain etiology for elevated hemoglobin (no volume depletion or hypoxia, low or normal erythropoietin level), granulocytosis (no active infection), or thrombocytosis (no hyposplenism, iron deficiency, or inflammation). This is a quantitative assay can be used to assist in diagnosis or monitor response to therapy to a sensitivity of 0.1% variant allele fraction.

Laboratory Testing for JAK2 mutation:
The preferred sample is 3mL of EDTA anticoagulated blood or 1mL of bone marrow (lavender-top) which may be refrigerated up to 72 hours before analysis by droplet digital PCR. Results are reported as positive or negative to a sensitivity of 0.1% variant allele fraction. All positive samples will be reported with a quantitative value.

References:

Website: http://labs.unchealthcare.org/directory/molecular_pathology/index_html
Questions? Call the Molecular Genetics Lab at (984) 974-1825