

# BRAF Mutation Detection

**Indication for Use Clinical Significance:** BRAF mutations are seen in 7% of all cancers. The vast majority of BRAF mutations are V600E missense mutations identified in a dominant hot spot within the kinase domain (BRAF exon 15).

The BRAF (B-Raf Proto-Oncogene, Serine/Threonin Kinase) encodes a protein belonging to the raf/mil family of serine/threonine protein kinases and is involved in the regulation of the MAP kinase/ERK signaling pathway. This pathway affects cell division, secretion and differentiation through several different phosphorylation cascades. Somatic mutations in BRAF are associated with several different neoplastic processes including colorectal cancer (CRC), melanoma, non-small cell lung cancer, adenocarcinoma of the lung, non-Hodgkin lymphoma and thyroid cancer. Germline pathogenesis variants have also been observed in cardiofaciocutaneous syndrome, Noonan syndrome and multiple lentiginos syndrome.

It has been shown that BRAF mutations in colorectal cancer (CRC) cause resistance to anti-EGFR therapy. Wild type BRAF is necessary for anti-EGFR treatment to work. BRAF and KRAS mutations are mutually exclusive. BRAF status could be a useful biomarker for selecting patients suitable for anti-EGFR treatment.

In malignant melanoma BRAF oncogene is mutated in greater than 60% of patients and mutant specific BRAF inhibitors have been developed. Presence of BRAF V600E mutation might predict better response to inhibitor therapy.

The same mutation is also observed in papillary thyroid carcinomas (PTC), accounting for approximately 44% of all cases. Studies have shown that these tumors have a higher frequency of extrathyroidal invasion and predisposition to neck-lymph node and distant metastasis. PTCs with BRAF mutations also have a higher recurrence rate.

**Testing Method:** The activating BRAF mutations are detected by DNA based next generation sequencing.

**Test Parameters:** The limit of detection of this assay has been determined to be approximately 5% of mutant allele(s) in the background of wild type allele.

**Turn Around Time:** 5-7 business days

**Sample Requirements:**

- Formalin fixed, paraffin embedded tissue
- Tissue sections
- Cytology slides
- Fresh frozen tissue

**CPT Codes:** 81210, 88381 may apply

Ship Specimens to:

Henry Ford Center for Precision Diagnostics  
Henry Ford Hospital  
Clinic Building, K6, Core Lab E-655  
2799 W. Grand Blvd.  
Detroit, MI 48202