

XX/XX/2011

Patient Name: Doe, Jane
Order ID: X1234567
MRN: MRN12345676
Attending Provider: William Smith, MD

DOB: 01/01/1961
Lab ID: L987654
Specimen ID: SPEC9876
Date Collected: 11/28/2010

Sex: Female
Type of Sample: FNA
Date Received: 12/01/2010

Mutation	Result	Mutation	Result
<i>BRAF p.V600E (GTG>GAG)</i>	+	<i>KRAS p.G12S (GGT>AGT)</i>	-
<i>NRAS p.Q61R (CAA>CGA)</i>	-	<i>KRAS p.G12R (GGT>CGT)</i>	-
<i>NRAS p.Q61K (CAA>AAA)</i>	-	<i>KRAS p.G12V (GGT>GTT)</i>	-
<i>NRAS p.Q61L (CAA>CTA)</i>	-	<i>KRAS p.G13D (GGC>GAC)</i>	-
<i>HRAS p.G12V (GGC>GTC)</i>	-	<i>KRAS p.G12D (GGT>GAT)</i>	-
<i>HRAS p.Q61L (CAG>AAG)</i>	-	RNA Translocations	
<i>HRAS p.Q61R (CAG>CGG)</i>	-	<i>RET/PTC1 TRANSLOCATION</i>	-
<i>KRAS p.G12A (GGT>GCT)</i>	-	<i>RET/PTC3 TRANSLOCATION</i>	-
<i>KRAS p.G12C (GGT>TGT)</i>	-	<i>PAX8/PPARγ TRANSLOCATION</i>	-

INTERPRETATION:

CLINICAL SIGNIFICANCE:

In 2009, the American Thyroid Association (ATA) drafted revised guidelines for patients with thyroid nodules and differentiated thyroid cancers. Part of the recommendations in these guidelines included molecular testing for BRAF, RAS, RET/PTC, and PAX8-PPAR γ within indeterminate thyroid nodules.¹ The presence of any of these markers within thyroid nodules has been strongly correlated with malignancy and are found in more than 70% of papillary thyroid carcinomas.² BRAF mutations have been shown to correlate with more aggressive forms of cancer.³ Mutation analyses of these markers have been shown to improve the preoperative identification and prognostic assessment of thyroid malignancies and enable an optimized surgical strategy.^{4,5,6} A negative result does not indicate a wild-type allele. This test detects the mutations listed and not other rare mutations which may be indicative of cancer.

ASSAY DESCRIPTION AND METHODOLOGY:

This test has been validated on Fine Needle Aspirate samples submitted in RNA *Retain*® preservative solution. DNA and RNA is extracted, amplified, and detected with probes specific for the following mutations. KRAS (G12R, G12V, G13D, G12D, G12A, G12C, G12S, BRAF (V600E), HRAS (G12V, Q61L, Q61R), NRAS (Q61R, Q61K, Q61L), RET/PTC1, RET/PTC3, PAX8/PPAR γ . The analytical sensitivity of this assay is at least 1% mutant DNA in a background of wild-type genomic DNA. **Disclaimer:** *in addition to V600E mutation (most common), this test may also detect rare, activating BRAF point mutations V600E2, V600D, and V600K.*

Jennifer R. Rushton, MD
Laboratory Director

Date

REFERENCES :

- Cooper D, et al. *Thyroid* (2009), 19(11) :1-48.
- Nikiforov, Y, et al. *JCEM* (2009), 94(6) : 2092-2098.
- Xing M, et al. *J Clin Onc* (2009), 27(18).
- Musholt T, et al. *World J Surg* (2010) 34:2595-2603.
- Moses W, et al. *World J Surg* (2010) 34:2589-2594.
- Cantara S, *J Clin Endocrinol Metab* (2010) 95(3).

Disclaimer: This laboratory developed test is intended to be used and interpreted in conjunction with all other available clinical and laboratory information. This test was developed and its performance characteristics determined by Asuragen's Clinical Laboratory. The Asuragen Clinical Laboratory is certified under CLIA '88 as qualified to perform high complexity testing and is accredited by CAP.