

## KRAS Mutation Analysis in Colorectal Cancer

### Description

Treatment with cetuximab (Erbix<sup>®</sup>) or panitumumab (Vectibix<sup>®</sup>) monoclonal antibodies (MoAb) directed against the epidermal growth factor receptor (EGFR) improves overall and progression-free survival and preserves the quality of life in a small percentage of patients with metastatic colorectal cancer (mCRC) who have not responded to chemotherapy. Determination of the mutation status of the *KRAS* gene in the tumor reliably predicts which patients will NOT respond to these anti-EGFR agents.

Tissue Tested: tumor specimen

Testing available: ARUP *KRAS* Mutation detection, test code: 0040248

[Link to ARUP](http://www.aruplab.com/guides/ug/tests/0040248.jsp) information on this test (<http://www.aruplab.com/guides/ug/tests/0040248.jsp>)

**Action: ASCO guidelines recommend tumor testing for *KRAS* mutations in all metastatic colorectal cancer patients being considered for treatment with anti-EGFR monoclonal antibodies. If the *KRAS* mutation analysis is positive for the presence of an “activating” *KRAS* mutation, indicating probable failure of response to cetuximab or panitumumab, then do NOT prescribe these agents.**

### Clinical Utility:

- Testing of the primary tumor for the *KRAS* mutation provides high negative predictive value; i.e., nearly all patients with a *KRAS* mutation will fail to respond to anti-EGFR MoAbs.
- Effectiveness of these agents in mCRC patients who are *KRAS* wild-type is about 60 - 70%.
- Effectiveness of these agents in unselected mCRC patients is 10 – 20%

### Additional Information:

- There are many other genes involved in the EGFR and other cancer pathways that may help predict outcomes associated with the anti-EGFR MoAbs; including *BRAF*, *PTEN*, and *PIK3CA*. Evidence is rapidly emerging but remains immature to make recommendations about the usefulness of these additional genes in CRC treatment decision.
- See, also, GeneInfo sheet on *BRAF* mutation analysis in Colorectal Cancer.

### Reference/Resources

1. American Society of Clinical Oncology Provisional Clinical Opinion: [Testing for \*KRAS\* Gene Mutations in Patients with Metastatic Colorectal Carcinoma to Predict Response to Anti-Epidermal Growth Factor Receptor Monoclonal Antibody Therapy](http://www.asco.org/ASCOv2/Practice+Guidelines/Quality+Care/Practice+Guidelines/Provisional+Clinical+Opinion). (<http://www.asco.org/ASCOv2/Practice+Guidelines/Quality+Care/Practice+Guidelines/Provisional+Clinical+Opinion>)