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# Chronicling KRAS

When mutated genes cause normal cells to grow out of control and become cancerous, they are called oncogenes. Currently, more than 100 oncogenes have been recognized, including KRAS, the first molecular marker to predict which colorectal cancer patients will respond to EGFR inhibitors.

**1964** RAS research can be traced back to Jennifer Harvey's research showing that a rat leukemia virus induces sarcomas in newborn rodents.

**1967** Kirsten Rat Sarcoma (KRAS) is identified in the rat sarcoma virus.

**1975** Oncogenes are found to play a role in the development of cancer.

**1976** Michael Bishop and Harold Varmus discover the first oncogene found in cells, named src—the same gene carried by the oncogenic virus described by Peyton Rous in 1916.

**1982** Mutant KRAS is identified in human cancers, and research shows mutated KRAS genes permanently activate KRAS proteins.

**1984** The EGFR pathway is found to involve KRAS activation.

**1987** KRAS gene mutations are identified in colorectal tumors.

**1994** KRAS proteins are found to activate other proteins associated with proliferation of cancer cells.

**1997** KRAS is shown to be essential for the development of tumors. Two years later, research confirms the function of KRAS in maintaining tumors.

**2006-2007** Research findings demonstrate the impact of KRAS status on the effectiveness of anti-EGFR drugs for colorectal cancer.

**2008** Data presented at the American Society of Clinical Oncology's annual meeting validate KRAS as the first molecular marker to determine targeted treatment in metastatic colorectal cancer. Patients with colorectal tumors expressing the wild-type (normal) gene respond better to Erbitux plus chemotherapy than patients with certain mutant forms of KRAS. Similar results were found for Vectibix, another anti-EGFR inhibitor approved for colorectal cancer.