

Cancer SEEK: Novel Approach

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ABSTRACT

Cancer SEEK is a non-invasive blood test that can be used to screen for multiple common types of cancer in asymptomatic apparently healthy individuals. It can detect eight common cancer types through assessment of the levels of circulating proteins and mutations in cell-free DNA. The majority of localized cancers can be cured by surgery alone without any systemic therapy. Once distant metastasis has occurred; however, surgical excision is rarely creative. There is a wide window of opportunity to detect cancer before the onset of metastasis. Early detection of cancer is key to reducing cancer deaths offers crucial buying time for patients to take advantage of timely therapy and treatment.

Key words: Metastasis, Mutation, SEEK

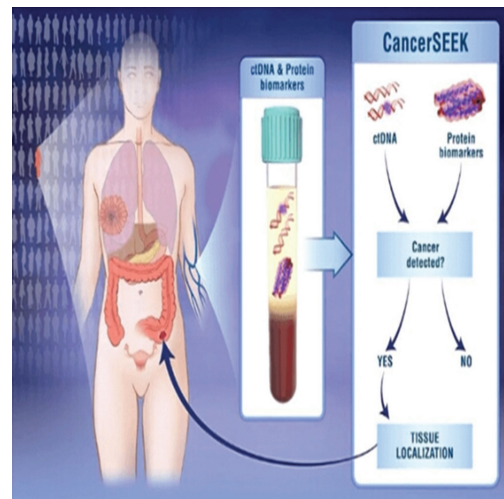
INTRODUCTION

Cancer SEEK (also called a liquid biopsy) is a test unique noninvasive revolutionary blood test that evaluates levels of eight cancer proteins and the presence of cancer gene mutations from circulating DNA in the blood. Bert Vogelstein, professor of oncology, is one of the inventors of Cancer SEEK that have made a significant advancement toward early tumor detection by developing blood test called cancer SEEK. The test utilizes DNA assays and protein biomarkers to spot tumors it could detect eight common cancers – Ovary, Liver, Esophagus, Pancreas, Stomach, Colorectal, Lung, and Breast cancer at relatively early stages. Earlier detection provides many ways to improve outcomes for patients.^[1]



HOW IT WORKS?

“Cancer SEEK tests both genetic and protein biomarkers in a patient blood.”



It can be performed without even knowing a cancer is present, often long before causing any symptoms, even very small tumors will begin to release minute amounts of mutated DNA and abnormal proteins into blood. While DNA and proteins are also released from normal cells, the DNA proteins from cancer cells are unique, containing multiple changes not

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present in normal cells. The newly developed blood based cancer DNA test is detecting one mutated fragment of DNA among 10,000 normal DNA fragments. It tests both genetic and protein biomarkers in a patient blood with a purified DNA from plasma sample amplified with multiplex polymerase chain reaction using a robust 61-amplicon panel that had the ability to detect rare mutations. This test measures circulating DNA from 16 genes as well as eight protein biomarkers, and then uses machine based learning to analyze. Cancer SEEK focused only on targeted sequencing of genes frequently involved in cancer progression in addition of eight protein biomarkers (CA 125, CEA, CA 19-9, Prolactin, hepatocyte growth factor, Osteopontin, Myeloperoxidase, and Tissue inhibitor of metalloproteinases) each characteristic of a specific type of cancer not only identifies the presence of relatively early cancers but also contributes to locating the organ of origin of these cancers.^[2]

It works by examining mutated DNA fragments released into the bloodstream by the cancer cells through processes called apoptosis (programmed cell death) and necrosis (premature cell and tissue death). The presence of mutation in an assayed gene or an elevation in the level of any of these proteins would classify a patient as positive.^[3,4]

CONCLUSION

For the first time, we have the promise of a screening test that will lead to earlier diagnosis and improved survival outcomes for many tumor types. This test represents the next step in changing the focus of cancer research from late-stage disease to early disease. Earlier detection provides many ways to improve outcomes for patients.

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